The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Chemical Award or Medal

THERE was quite a keen debate at Wembley Park on Tuesday among the chemical exhibitors at the British Empire Exhibition as to whether exhibitors should be granted a commemorative medal or a competitive award, consisting of either a grand prize, an award of honour, or a gold medal. What appeared for the moment to be a good case for the competitive system was put up by Mr. Howard and Mr. Linstead. They argued that an exhibitor who spent exceptional pains on the character of his exhibit was entitled to have some permanent acknowledgment of his effort, that the awards held by old exhibiting firms were valuable commercial assets, that younger firms were entitled to a chance of achieving similar successes, and that the element of friendly rivalry would stimulate the whole body of exhibitors to do their best.

These arguments, however, were conclusively overruled when the vote came to be taken, for only two representatives were found to support the competitive system. The principal objections appeared to be that the business of allotting awards was a rather perfunctory one, that the honours were given more often for the size and decorative scheme of the exhibit than for the quality of the products shown, and that the richer firms, on account of their larger resources, would have obvious advantages over the less wealthy. It was further pointed out that the main object of the exhibition was to demonstrate the resources of British chemical industry rather than to ensure immediate personal advantage to the exhibitor, and that a commemorative medal or something of the kind granted to all exhibitors would sufficiently mark the enterprise of those taking part in the exhibition. These arguments, supplemented by Sir Lawrence Weaver by a delightful example of how awards were made at a certain international exhibition, settled the question. By a decisive majority the chemical exhibitors rejected the competitive idea and decided to recommend the award to all exhibitors of a commemorative medal and diploma. In this matter the chemical exhibitors are in agreement with the general body of opinion, so far as it has yet been ascertained.

In the course of the visit the arrangements for the chemical section were explained, and were received with complete satisfaction. The site, on the left of the grand avenue entered from the North Gate, is excellent, the scheme has been very carefully thought out with regard both to the total effect and individual convenience, and the exhibitors have been infected with the organisers' enthusiasm for making the chemical section a real success.

Some Interesting Nitrate Facts

IT is not frequently that one comes across such a masterly survey of facts relating to a particular industry as that which Dr. H. A. Curtis gave in a recent address in America. Dr. Curtis is professor of chemical engineering at Yale University, and his work, in addition, as head of the nitrogen division of the Bureau of Foreign and Domestic Commerce, has placed him in an unusual position from the standpoint of obtaining reliable and firsthand information. It is well known, of course, that since the war every one of the allied nations has been engaged in endeavouring to develop independence of the Chilean nitrate supply, for to have one's main source of nitrogen several thousand miles away is a dangerous state of affairs from the point of view of national defence. At the present time, however, the provision of an alternative source comes down to a question of economics, and in this connection it would seem that the only competitor with Chilean nitrate is the nitrogen of coal. Under peacetime conditions synthetic nitrogen producers have scarcely been given a chance to show what they can do, for conditions in Germany have been in a more or less chaotic state, and one of the largset nitrogen-producing plants which is in the Ruhr is now closed, while difficulties associated with the supply of materials, particularly fuel, have impeded the operation of other plants.

While, therefore, the Chilean nitrate producers would seem to have no cause to fear a price war for

some little time to come, considerable interest in the future of the industry is naturally displayed. The main point is that it is possible to produce nitrate in Chile very much more cheaply than is now being done. It is found, for instance, that of the nitrate which is present in the raw ore, 25 to 40 per cent. is not recovered, while the methods of heating are wasteful. There are also unnecessary overhead charges incurred in carrying along high-production-cost oficinas which should be abandoned to make way for lower-cost producers. It is also possible that under conditions of competition the companies would be willing to take less profit. Again, i is well known that the nitrate business has been a very profitable proposition. There are certain factors, however, which may operate to increase the cost of nitrate in Chile—notably, higher wages and higher handling costs in general.

Another direction in which price-lowering could be effected is by a reduction in the Chilean Government export tax. Early in the history of the industry a tax was fixed which represents between 25 and 40 per cent, of the cost of getting nitrate out of Chile. This tax has always been the mainstay of the country, and it is said that it represents about 60 per cent. of the whole revenue of the Chilean Government. Accordingly the view is taken that the country is gradually being depleted of its natural wealth, and it is unlikely that the tax will be reduced until the industry is really threatened. Taking all points into account, however, Dr. Curtis is of the opinion that, considering the general inefficiency of the industry and the chances for improvement, and the general possibilities of cheaper nitrate from Chile, it is evident that Chilean nitrate will be able to offer strong competition to fixed nitrogen from other sources. Finally, one interesting point emerges in connection with the duration of the supply. Sir William Crookes, in 1898, startled us in this country by saying that there was a supply in Chile for only about fifty years. He has proved to be at least 400 per cent. out. The supply in Chile will last for no one knows how long, but for at least 200 years and, perhaps, longer, particularly if some method is discovered of working profitably the lower-grade ores.

Gas Liquor for Water Softening

It is nowadays becoming the rule rather than the exception to employ some form of water treatment plant on works where use is made of steam boilers, condensing, and such apparatus. In those cases where large volumes of water are concerned the expenditure in putting down one of the recognised treatment and softening plants which are now to be had is readily justified, but when it comes to the smaller works it is frequently a question of improvisation and of the adoption of some simple method which will effect its purpose reasonably well. In such cases one most commonly finds the use of boiling with exhaust steam in conjunction with an alkali, and the cost of the latter is the only item of expenditure that has to be considered. Carbonate or silicate of soda are frequently employed for the purpose, but M. Chevalet, a French engineer, has lately been experimenting with ordinary crude ammoniacal liquor, and he is of the opinion that the combination of this liquor and heat presents a method of feed-water treatment which is very simply controlled from the chemical standpoint, and calls for plant of far smaller dimensions than are necessary with more general methods.

Explained briefly, it is found that if a small quantity of ammoniacal liquor, sufficient to produce an alkaline mixture, is added to the untreated water, cloudiness results which proves to be due to precipitated carbonate of lime, previously combined with the carbon dioxide in the water. The process consists in the repeated agitation by steam of the feed-water as it flows over trays, the ammoniacal liquor being added to the water drop by drop, a rough guide as to the quantity of liquor required being that of taking a sample from the outlet of the softener and adding an excess of liquor when the absence of a precipitate is an ample safeguard. M. Chevalet has found that a very small quantity of ammoniacal liquor will serve for an indefinite period, and it is preferable to supply sufficient liquor for a maximum throughput of water, particularly as an excess is in no way harmful. The process is one which should be worth the attention of those small works where ammoniacal liquor is among the products made.

The Institute at Work

The Institute of Chemistry may be congratulated on its activities among professional chemists in various parts of the country. Following upon an address at Bristol, in which he offered to chemical students some excellent professional and paternal advice, the President (Mr. Chaston Chapman) opened on Thursday an important conference in Liverpool, and reviewed in his opening address some features of Institute policy. The problems down for discussion at the conference are largely of a domestic character, but one item may be selected as of wider interest. It is a proposal that distinctive robes should be designed for use by Fellows. Apart from the stimulus to trade that would result from such a large order of new robes—for every living Fellow would assuredly wish to possess his canonical garment—the idea is seriously worth entertaining. The F.I.C. is a degree of good standing, accepted everywhere as a guarantee of sound knowledge and attainments, and though a Fellow's robes would add nothing to its intrinsic value they might add distinctly to its dignity and academical interest. We must not prejudge so delicate an issue, but shall be interested to hear what the members themselves think of it.

Improving Chemical Exports

Although the official returns for the month of September issued by the Board of Trade indicate once again a decrease in the value of the chemical imports of about £9,000 on last year's figure and of £300,000 on that for August of this year, the figures for the export trade are the most promising that have been published for some time. The total value of chemicals, dyes, drugs, and colours exported during last month topped the two million mark, the actual figure being £2,341,761. This represents a substantial increase both on September, 1922, and on last August, in each case of the order of about £600,000. These figures as they stand are very encouraging to those interested in the development of British chemical manufactures, and taken in conjunction with the more favourable reports now being received from the

markets, would seem to indicate definitely that the recent signs of another "slump" were only of a temporary nature. The detailed returns of the export of particular products are also of interest in several cases. The great increase of synthetic dyestuff exports has been commented upon before, and is an excellent testimonial to the value of the British dye industry. The figures for the month under consideration are about 180 per cent. above those for last year. Outstanding increases have also taken place in other coal tar products (notably benzol and toluol), sulphuric acid, and sulphate of ammonia.

Precautions with Fire Extinguishers

SOME three years ago attention was drawn in these columns to the danger which may arise, if due care is not taken, from the use of fire extinguishers in which carbon tetrachloride is employed. It will be recollected that at about that time an investigation was made in America of the decomposition products of this liquid, the result of which showed that phosgene was formed in toxic quantities. It is interesting to note that a further series of experiments has recently been concluded by the U.S. Bureau of Mines relating to the dangers arising from gases and smoke resulting from the application of carbon tetrachloride extinguishers to electric arcs, burning insulation, or fires such as may occur in electrical apparatus and machinery. It was found that the application of one cubic foot of fire extinguisher to electric arcs and burning insulation in a chamber of 1,000 cubic feet capacity developed phosgene, chlorine, and hydrogen chloride in quite dangerous concentrations. Carbon tetrachloride vapours, sulphur dioxide, and carbon monoxide were also formed in less dangerous concentrations. These tests confirm conclusions drawn from the previous tests—namely, that it is dangerous to breathe the gases that may be generated from a 1-quart carbon tetrachloride extinguisher applied to a fire in a confined space from which escape is difficult or impossible, and from which the gases would not be removed by ventilation. So far as is known, carbon tetrachloride extinguishers are the most effective and satisfactory of any that can be applied in emergencies of the kind, but it is as well that those who have them should appreciate that there are right and wrong ways of using them.

The Chemical Foundation Suit

ONE stage has now been completed in one of the greatest chemical suits ever tried in America—that brought by the United States Government against the Chemical Foundation, Inc., for the recovery of the seized enemy-owned patents which were sold to the Foundation by the Alien Property Custodian in 1919. The taking of evidence has been concluded, arguments by counsel will probably begin this week, and the final decision is expected about the close of the year. The rule which in this country prohibits the discussion of causes still *sub judice* seems to be considerably more lax in the States, and the chemical Press are already commenting on the facts brought out in evidence with a freedom that would be dangerous here. For the present it is sufficient to say that the main contention upon which the United States Government rely is that the sum of 250,000 dollars—about £55,000—paid for the 4,800 enemy-owned patents was totally inadequate, and that the Government agents were not fully informed of their true value when the property was sold. The decision will be an important one for the American chemical industry. It will also have an interesting bearing on the point whether a Government, supposing it makes a bad bargain as trustee for enemy subjects, should make good the loss to them itself, or rescind the sale and penalise the purchaser.

Points from Our News Pages

Chemical exhibitors at the British Empire Exhibition visited the grounds at Wembley Park on Tuesday (p. 415).

An abstract is published of the annual report of the British Association of Chemists (p. 420).

Mr. Paul Wooton, who has been investigating British industrial conditions, gives some impressions of the British chemical industry (p. 423).

Dr. J. Crowley contributes an appreciation of the late Dr. J. A. Harker (p. 423).

According to our London Market Report the improved demand has been maintained (p. 433).

Business in the Scottish chemical market shows signs of a slight improvement, according to our Market Report (p. 436).

Books Received

RADIOACTIVITY. By K. Fajans. London: Methuen and Co., Ltd. Pp. 138. 8s. 6d.

THE GENESIS OF PETROLEUM. By Percy Edwin Spielmann. London: Ernest Benn, Ltd. Pp. 72. 5s.

VAN NOSTRAND'S CHEMICAL ANNUAL. Edited by John C. Olsen. London: Constable & Co., Ltd. Pp. 802. 21s.

BLASTING WITH HIGH EXPLOSIVES. By W. Gerard Boulton. London: Sir Isaac Pitman and Sons, Ltd. Pp. 108. 5s.

THE MANUFACTURE OF NITRIC ACID AND NITRATES. By Allin Cottrell. London: Gurney and Jackson. Pp. 454. 36s.

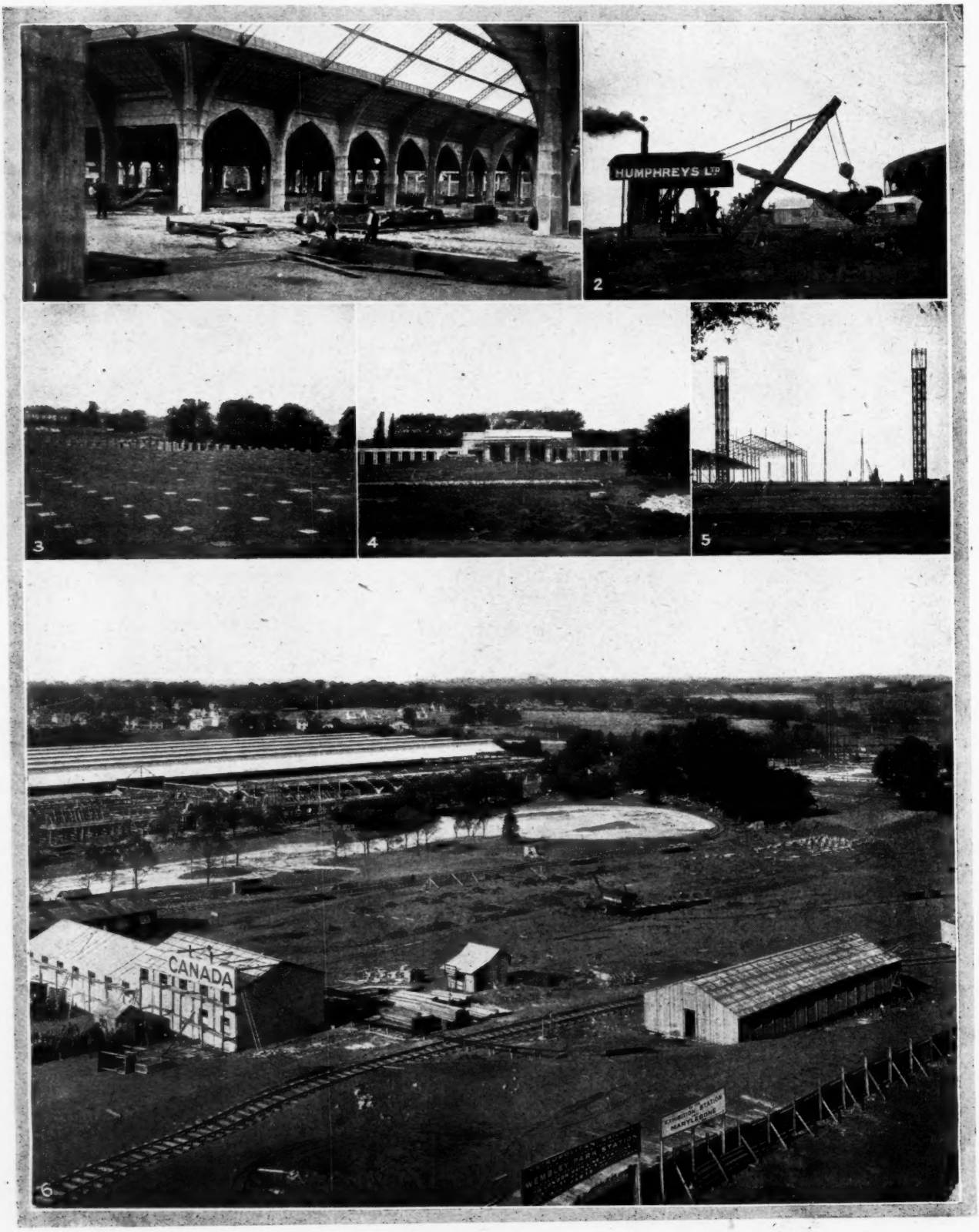
SYSTEMATIC ORGANIC CHEMISTRY. By W. M. Cumming, I. Vance Hopper and T. Sherlock Wheeler. London: Constable and Co., Ltd. Pp. 536. 25s.

The Calendar

Oct.		
21-26	Third Industrial Chemistry Congress.	Paris.
22	Institute of Physics: "Physics in the Textile Industries," by Dr. A. E. Oxley. 5.30 p.m.	Institution of Electrical Engineers, London.
23	Northern Polytechnic Chemical Association: "Chemistry of Trinitropoluene." Sir Robert Robertson.	Holloway, N.7.
24	Institute of Chemistry (Manchester Section): Annual General Meeting. 7 p.m.	Textile Institute, Manchester.
25	Society of Dyers and Colourists (London Section): "Hydrogen Peroxide Bleaching." Mr. I. E. Weber. 7 p.m.	Dyers' Hall, Dowgate Hill, London, E.C.4.
25	Society of Dyers and Colourists (Midlands Section): "Ramie and its Application in Textile Industries." Mr. William Marshall.	Nottingham.
26	West Cumberland Society of Chemists and Engineers: "The Constitution of Carbon Steels." Mr. J. Millership.	Technical College, Workington.
27	British Association of Chemists: Annual Meeting and Dinner. 6.30 p.m.	Queen's Hotel, Birmingham.
27	West Yorkshire Metallurgical Society: "Some Physical and Chemical Properties of Refractory Materials." Mr. W. S. Houldsworth.	Technical College, Bradford.

Views of the British Empire Exhibition Works at Wembley Park

The Site of the Chemistry Section is Shown in the Top Left-Hand Corner



Chemical Exhibitors' Visit to Wembley Park

Decision Against Competitive Awards

On Tuesday the chemical exhibitors at the British Empire Exhibition paid a visit to Wembley Park to inspect the progress of the works there and to have explained to them the position which the chemical section will occupy in the Palace of Industry. A large party representing the majority of the firms whose names appear below travelled down in charge of Mr. Woolcock, and on arrival at Wembley Park were met by Sir Lawrence Weaver, Mr. C. Williams Ellis and other officials. The works are still in the early stage and it is difficult to visualise the ultimate result, but the scale is impressive, and the prospects from every point of view are good. Among the chemical visitors on Tuesday there was no trace of doubt as to the success of the chemical section. The reasons for their decision to exhibit may vary. Some say frankly it is to get business; others that it is a patriotic interest in British trade. But there can be no doubt as to the fact that Mr. Woolcock has behind him the loyal support of the heads of the industry, and that all that is reasonably possible will be done to make the chemical exhibition really representative.

One great advantage has been secured at the start. The site is excellent. Entering the Palace of Industry—an immense building, part of which is already roofed—by what is called the North Gate, the visitor faces a splendid avenue. Immediately on the left is the chemical exhibition, filling up one corner of the great building. One side faces the North Avenue, and side avenues conveniently enclose the complete section. The visitors were shown in the rough state the site of their stands, and the general impression was that the arrangements were excellent.

After an inspection of the chemical area, the party, under the guidance of Sir Lawrence Weaver, visited other sections of the exhibition, heard some interesting statements as to the progress made, and finally sat down to tea in the canteen. Here Sir Lawrence Weaver thanked the visitors for attending in such good numbers and dealt with some details of the organisation. He explained that all the exhibition authorities provided was floor and roof, but they had consented to undertake the cleaning of the gangways.

Mr. Woolcock stated that with respect to fire-extinguishers the executive committee had decided on the ground of economy to provide the necessary fire-extinguishers out of a fund to be raised by a contribution levied on the exhibitors at the rate of 3s. 6d. per square foot. With respect to insurance arrangements had been made for favourable terms and it was proposed that the executive committee should provide the insurance required by the various exhibitors at the reduced rates which were made possible by negotiating directly with the official brokers.

The Question of Awards

Mr. Woolcock introduced the question whether competitive awards should be made to exhibitors or a commemorative medal awarded to all exhibitors and asked for an expression of opinion.

Mr. Howard (Ilford) strongly advocated the granting of awards. From the exhibition of 1851 down to the great exhibition of about ten years ago his firm had secured numbers of awards and these were a great asset. An award was worth working for and was one of the incentives to a competitor to make the best show possible. Those who worked hard to produce a good exhibit were entitled to recognition.

Mr. Linstead (Burroughs and Wellcome) also strongly supported the system of competitive awards. Such awards, he said, were held by many of the older firms, and were of real value. It seemed to him only fair that younger firms should have opportunities of obtaining similar awards, and that nobody would suffer but everybody gain by healthy competition.

The representative of Jeyes' also supported the idea, mentioning that the firm had 151 medals all honestly gained, and possessing a distinct value.

Mr. Miller-Jones argued that exhibitors should not go into the exhibition solely with a view to obtaining an award. The object was to benefit British trade, to let the public know something of the British chemical industry, and to extend business both for the industrial exhibitor and for the industry as a whole. The granting of awards would involve the appointment of a jury or committee, and it would be very difficult to agree on the real tests of a good exhibit and to get an independent judgment. He recalled the case of an analytical chemist who was once appointed to buy hay for the Government (laughter). He would very much prefer a diploma or commemorative medal, which would give recognition to those who were exhibiting as against those who were not.

Sir Lawrence Weaver stated that, although he did not wish to influence their decision, they might like to know that the weight of opinion, so far as at present ascertained, seemed to be distinctly against competitive awards. The fact that a firm had exhibited at all was worthy of honour, and those who exhibited would all have that recognition in a commemorative medal.

It was pointed out in further discussion that the larger firms, on account of their larger financial resources, would have a much better chance of gaining awards than the small firms, and that very often such awards were made on account more of size and decorative effect than of quality of production.

Finally, in order to take the opinion of the meeting, Mr. Linstead moved and Mr. Howard seconded a resolution in favour of awards on a competitive basis consisting of a grand prize, award of honour, and gold medal.

Only two votes were given in support of this and it was then decided to recommend that a commemorative medal and diploma be awarded to each exhibitor.

The proceedings concluded with a vote of thanks to Sir Lawrence Weaver, moved by Mr. Woolcock.

List of Subscribers

Ajax Aniline Dye Manufacturing Co., Ltd., Albright and Wilson, Ltd., Stafford Allen and Sons, Ltd., J. and E. Atkinson, Ltd., F. W. Berk and Co., Ltd., A. Boake Roberts and Co., Ltd., Boots Pure Drug Co., Ltd., J. C. Bottomley and Emerson, Ltd., British Alizarine Co., Ltd., British Cyanides Co., Ltd., British Drug Houses, Ltd., British Dyestuffs Corporation, Ltd., The British Soap Co., Brunner, Mond and Co., Ltd., Bryant and May, Ltd., Burgoyne, Burbidges and Co., Ltd., Burroughs Wellcome and Co., Burt, Boulton and Haywood, Ltd., W. J. Bush and Co., Ltd., Carnegie Bros., J. M. Collett and Co., Ltd., The Colne Vale Dye and Chemical Co., Ltd., Clayton Aniline Co., Ltd., Joseph Crosfield and Sons, Ltd., Cussons, Sons and Co., Ltd., James H. Dennis and Co., Ltd., Joseph Dixon Crucible Co., Dolly and Drummer Dyes, Wm. Edge and Sons, Ltd., Duncan Flockhart and Co., Ltd., The Erasmic Co., Ltd., Fairy Dyes, Ltd., Gas Light and Coke Co., D. and W. Gibbs, Ltd., Wm. Gossage and Sons, Ltd., Gray's Dyes and Colours, Ltd., J. Grossmith and Son, Ltd., The Graesser-Monsanto Chemical Works, Ltd., Herbert Green and Co., Ltd., Grout and Co., Hardman and Holden, Ltd., C. R. Harker Stagg and Morgan, Ltd., Hickson and Partners, Ltd., Thos. Hill-Jones, Ltd., L. B. Holliday and Co., Ltd., Hopkin and Williams, Ltd., Howards and Sons, Ltd., Robt. Ingham Clark and Co., Ltd., Jeyes' Sanitary Compounds Co., Ltd., Johnson and Sons, Manufacturing Chemists, Ltd., H. and T. Kirby and Co., Ltd., B. Laporte, Ltd., The Leeds and Bradford Boiler Co., Ltd., Lever Bros., Ltd., T. Lye and Sons, J. F. Macfarlan and Co., McDougall and Robertson, Ltd., May and Baker, Ltd., The Midland Tar Distillers, Murgatroyd's Salt Works, Ltd., Naylor Bros. (London), Ltd., Newton Chambers and Co., Ltd., Orr's Zinc White, Ltd., J. C. Oxley's Dyes and Chemicals, Ltd., A. and F. Pears, Ltd., Price's Patent Candle Co., Ltd., Wm. Ransom and Son, Ltd., J. J. Rigby, Ltd., Eugene Rimmel, Ltd., J. L. Rose, The Salt Union, Ltd., Scottish Dyes, Ltd., T. and H. Smith, Ltd., The South Metropolitan Gas Co., Spencer Chapman and Messel, Ltd., Peter Spence and Sons, Ltd., J. and E. Sturge, Ltd., Silk's Toilet Co., Taylor Bros. and Cox, Ltd., Thos. Tyrer and Co., Ltd., "Thamar," The United Alkali Co., Ltd., The Washington Chemical Co., Joseph Watson and Sons, Ltd., Whiffen and Sons, Ltd., Oliver Wilkins and Co., Ltd., J. B. Wilkinson, Williams Bros. and Co., J. and J. White, Ltd., Yardley and Co., Ltd., The Zee-Kol Manufacturing Co.

Exhibition Committees

Publication Committee.—Dr. E. F. Armstrong, F.R.S. (Chairman), Mr. E. V. Evans (Secretary), Professor J. W. Hinchley, Dr. H. Levinstein, Dr. Stephen Miall, Mr. R. B. Pilcher, Dr. Plimmer, Professor J. Thorpe and Mr. W J. U. Woolcock.

Executive Sub-Committee.—Mr. H. Barrett, Mr. Guyton Butler, Mr. E. W. Evans, Mr. G. Gibbs, Mr. C. A. Hill, Mr. E. Linstead, Sir Max Muspratt, Bart., General N. W. Webber and Mr. W. J. U. Woolcock (Chairman).

Scientific Committee.—Dr. Herbert Levinstein (Chairman) (Society of Chemical Industry), Dr. Stephen Miall (Secretary) (Federal Council), Mr. J. Baker (Society of Chemical Industry), Mr. F. H. Carr (Society of Chemical Industry), Mr. E. V. Evans (Society of Chemical Industry), Dr. J. T. Hewitt (Chemical Society), Mr. J. B. Atkinson (Society of Dyers and Colourists), Mr. T. Marns (Pharmaceutical Society), Mr. E. T. Neathercoat (Pharmaceutical Society), Mr. R. B. Pilcher (Institute of Chemistry), Commander R. E. Stokes-Rees, R.N. (Institution of Petroleum Technologists), Professor J. F. Thorpe (Chemical Society), Professor J. W. Hinchley (Institution of Chemical Engineers) and Mr. W. J. U. Woolcock.

Hiring or Buying a Chemical Pump

In the Mayor's and City of London Court, on October 11, before Judge Shewell Cooper, the Pulsometer Engineering Co., Ltd., of Reading and Tothill Street, Westminster, sued the Isis Chemicals and Dyes, Ltd., a company registered in the Isle of Man, for £27 for the hire of a No. 3 Geryk vacuum pump.

Defendants paid £7 into Court in satisfaction of the claim. Mr. Longland, for the plaintiffs, said that the claim was for nine months' hire of the pump, which was used for chemical purposes, at £3 a month. Plaintiffs said that the original bargain was to hire the pump to the defendants with the option of purchase, but the option had not been exercised by the defendants. Under the option they could purchase the pump for £10 within 28 days of the despatch from London. The defendants had paid for the first month's hire of £3 and had kept the pump ever since. Plaintiffs now claimed for nine months' hire, and defendants were still liable for £3 a month. Albert Sweetman, plaintiffs' London manager, said they had never received any intimation from the defendants to the effect that they had decided to purchase the pump. If such an intimation had reached them, of course the present claim would never have been made. Mr. Charles Field, director of the defendant company, said they did not receive the pump until November 18 to November 20. Within 28 days of that time he exercised his option and told the plaintiffs that he would purchase the pump. As he had paid £3 to the plaintiffs, they had now paid £7 into Court, which was all they owed.

The Judge said the circumstances were a little peculiar. he could not accept the defendant's story, and he must give judgment for plaintiffs for £27 with costs. If the company chose to exact their pound of flesh, there would be nothing to prevent them issuing proceedings for the £3 a month which was still running on, but he earnestly hoped they would do nothing of the sort. He did not suppose the plaintiffs wanted to get £3 a month for the rest of their natural lives for the pump.

The Journal of Scientific Instruments

The National Physical Laboratory are co-operating with the Institute of Physics in producing a *Journal of Scientific Instruments*, the first monthly number of which has just been issued. Its purpose is to describe methods of measurement and the construction and use of instruments used in all branches of scientific and technical work. This is the first publication of its kind in England, and the favourable reception accorded to a preliminary number issued last year has led the publisher to the belief that it will have real value as an aid to research and manufacture. The present number contains articles on The Measurement of True Height by Aneroid, Methods of Measuring the Internal Diameters of Transparent Tubes, A General Purpose Recording Drum, The Chain Balance, and An Improved Temperature Control for the Pulfrich Refractometer, by various authorities.

The Journal will be published on the 15th of each month at 2s. 6d. a number and the annual subscription is 30s. post free. Copies of the Journal may be obtained through any bookseller, or direct from the Institute of Physics, 10, Essex Street, London, W.C.2.

An Enterprising Local Exhibition

The "Wonders of Science" at Surbiton

A scientific exhibition in aid of the funds of a church is decidedly unusual, yet such is the *raison d'être* of the second "Wonders of Science Exhibition" at the Surbiton Assembly Rooms, which was opened on Saturday last (October 13) by the Rt. Hon. J. H. Whitley, the Speaker in the House of Commons. Naturally, in such an exhibition, the field covered is very wide, and prominence is given to such exhibits as invisible inks, singing tubes, "hearing light" and other wonders. Thanks, however, to the co-operation of members of such bodies as the National Physical Laboratory, the Birkbeck Institute, and the Royal College of Science, a very large number of instructive exhibits are shown, not only of popular scientific interest, but of industrial importance also, among which may be mentioned an "Intertype" printing machine, the Bolwald Daylight Lamp, and demonstrations of glass blowing by the Duro Glass Co., Ltd. It is satisfactory to note that the exhibition has been extremely well attended, 700 visitors having been present on Monday afternoon.

Items of Chemical Interest

There is a definite chemical and medical section, in which there are a number of interesting exhibits. Various stages in the preparation of insulin, the new remedy for diabetes, are shown by Dr. Maxfield, and samples of the finished product by Allen and Hanbury, Ltd. An exhibit arranged by the research department of the Anglo-Persian Oil Co., Ltd., under the direction of Dr. A. E. Dunstan, shows samples of the crude oil of Maidan-i-Nastun, one of the richest mineral oils worked at the present time. The Ergometer, a means of testing the desulphurising power of the mineral bauxite which is used in the manufacture of kerosene, is also on view. This apparatus measures the heat of welding of bauxite by kerosene and it has been found empirically that this function is closely connected with the desulphurising power of the mineral. The effect of bauxite on crude kerosene is demonstrated, and also the effect of other decolourising and desulphurising earths, such as (1) silica gel; (2) Death Valley clay; (3) acid-treated clay.

Nobel Industries, Ltd., have lent an interesting exhibit which contains samples of the raw materials used in the industry, with the raw intermediate products such as acetyl cellulose, the completed articles as sold, and also some of the chemicals actually used in the production of the cellulose derivatives (which latter form the basis of such products as guncotton, artificial silks, imitation leather, horn or ivory) and used in converting these to their final form as shown. Dyed specimens of "Celanese" silk are prominent in this exhibit. In addition, the same firm show various stages in the manufacture of "Ironclad" gas mantles, and examples of explosives and plastic wood, this latter substance being made from wood meal, collodion and other ingredients, and from a thick paste it quickly dries and becomes of the consistency of wood itself, of which it has practically the same properties.

Another exhibit shows chaulmoogra seeds, the ethyl ester derived from them, and a series of photographs showing the value of the chaulmoogra treatment in cases of leprosy. Demonstrations are given of various scientific experiments such as the spectroscope, catalytic combustion as illustrated by the platinum gas lighter, the seeding of supersaturated solutions with crystals, vortex rings, etc.

Engineering and Electrical Exhibits

In the general section of the exhibition practical demonstrations are given at intervals of electric welding by Messrs. G. D. Peters and Co., Ltd., by the Wilson Plastic Arc system. The process is carried on behind a screen with deep blue glass windows, and may thus be clearly followed. Examples of the finished work are also on view. A series of examples of worked steel has been lent by the Park Gate Iron and Steel Co., Ltd., and test pieces of pure aluminium which have been converted to single crystals by Professor Carpenter, F.R.S. The method of testing steel for tensile strength may also be seen. There are a number of models, one being of a standard land type steam generator, with superheater and chain grate stoker by Babcock and Wilcox, Ltd., who also show models of a lever-balanced luffing jib crane, a gravity bucket conveyor, and a soot blower as used on water tube boilers. We may

also mention the thermo-electric pyrometer for measuring temperatures of 1,400° to 2,552° C., by A. Gallenkamp and Co., Ltd., and the various industrial electrical instruments by Venner Time Switches, Ltd.

The exhibition remains open until to-day (Saturday), from 3 to 10 p.m.

Oil and Colour Chemists

Dr. J. J. Fox on the Solubility of Lead Compounds

At the first meeting of the session of the Oil and Colour Chemists' Association on Thursday, October 11, Dr. J. J. Fox, of the Government Laboratory, read a paper on "The Solubility of Lead Compounds Used in Paints." Under the Factory and Workshops Act of 1920, a "lead compound" was defined, he said, as any compound of lead, other than galena, which, when treated in the manner prescribed, yields to an aqueous solution of hydrochloric acid, a quantity of soluble lead compound exceeding, when calculated as lead monoxide, 5 per cent. of the dry weight of the portion taken for analysis. The prescribed manner was the following:—A weighed quantity of the material which had been dried at 100° C. and thoroughly mixed, is to be continuously shaken for one hour, at the common temperatures, with 1,000 times its weight of an aqueous solution of hydrochloric acid containing 0·25 per cent. by weight of hydrogen chloride. This solution is thereafter to be allowed to stand for one hour and then filtered. The lead salt contained in the clear filtrate is then to be precipitated as lead sulphide and weighed as lead. The effect of this legislation and the Orders made under it might ultimately result in placing a solubility limit on paint pigments wherever women and lads are likely to be employed under such conditions as to be exposed to lead dust or fumes produced in the manufacture and use of the pigments. It followed, therefore, that chemists in the industries concerned had some new facts to consider in addition to their ordinary functions.

Dr. Fox then reviewed the origin and scope of the solubility test as laid down in the Orders. The main reasons, he said, for deciding upon the procedure finally adopted in the solubility test as regards time of shaking, temperature and quality of acid used were stated as follows:—(1) Ordinary room temperature was deliberately chosen because it was more convenient to shake vigorously in an open mechanical shaker than in a thermostat at blood heat, and he saw little objection to this as the quantity of lead oxide dissolved would undoubtedly be less at room temperatures than at 38·4° C. (2) Shaking for one hour was found in practice to yield by far the greater proportion of the soluble lead oxide, and further shaking did not give much more. For both these reasons the solubility result tended to be low, except in those compounds where the whole of the lead dissolved, as is the case with lead monosilicate, litharge and easily dissolved lead compounds in general. (3) The quantity and strength of the acid were chosen to simulate as far as possible the action of the acid in the stomach, for to the hydrochloric acid of the gastric juice was attributed the greater part of the solvent action on lead compounds. The use of 1,000 times as much acid as lead compound was decided upon, after it had been ascertained that in the absence of excess of acid, easily soluble lead compounds would appear to be insoluble. The reason for this was simple, for it was found that insoluble lead oxychloride could readily be formed. In fact, by suitably choosing the relative proportions of white lead or litharge and 0·25 per cent. hydrochloric acid only traces of lead will pass into solution, although these compounds were obviously dissolved in moderate excess of hydrochloric acid.

An important consideration in the solubility of lead compounds was the undoubted effect of fine grinding, and all the experiments in the Government laboratories had shown that with lead compounds used in paints, the degree of fineness was usually such as to ensure the maximum solubility under the conditions of the test.

Solubility Test Adopted

Recently the Committee on Painting adopted the solubility test as one of their recommendations for limiting the quantity of lead compounds in paints. While this recommendation had not been acted upon, certain Government Departments did attempt to carry it out, and the solubility test had, in fact, been to some extent incorporated in legislation in other directions. The Departmental Committee on House Painting and Coach Painting adopted the above test, and it was to be applied to the pigment after removal of oil, varnish and thinners. Some authorities had acted upon this recommendation and attempted, more or less successfully, to obtain paints complying with the 5 per cent. limit. Until the contrary was demonstrated, it might be assumed that a paint pigment containing not more than 5 per cent. of soluble lead oxide was to be considered comparatively innocuous, except during the process of burning off old paint, where the state of combination of the lead might be altered.

The results of a long series of experiments were then given, showing that many coloured paints of ordinary composition contain less than 5 per cent. of soluble lead, thus complying with all the requirements hitherto proposed by any body in this connection. In the course of the paper, Dr. Fox readily acknowledged the valuable work done by Mr. Klein, of the Brimsdown Lead Co., in connection with lead and lead compounds. White lead, litharge and red lead were shown to be entirely soluble in 0·25 per cent. hydrochloric acid. The lead in basic lead silicates and lead monosilicates is completely dissolved. Generally, the excess of lead oxide present in "basic" lead compounds—i.e., the excess over the equivalent required to form the normal salt, was completely dissolved.

Discussion

Mr. C. A. Klein (Brimsdown Lead Co.) opened the discussion, and after expressing satisfaction at having Government chemists who would come in among the manufacturing chemists and discuss these matters on chemical lines, said that it had been established that the danger of lead poisoning was due to dust, and as we had been told that the danger of lead poisoning was 100 times greater when the lead compound entered the lung, it was a question whether solubility in gastric juice had the importance which was given to it in the so-called Government test. Therefore, he thought, we must look upon the 5 per cent. solubility test as a wholely empirical one, and although it had undoubtedly proved its value in practice in the pottery industry, he did not think we could go very far beyond that.

Dr. T. M. Legge (H. M. Chief Medical Inspector of Factories) quoted figures showing how lead poisoning has been reduced in the pottery industry, and said that the results were sufficient to clinch the matter, so far as he was concerned, as to the value of the solubility test. As a scientist he was indifferent whether the inhalation was through the lung or through the stomach, but the statistics, since the legislation in the pottery industry referred to, all showed that low solubility glaze was innocuous, and therefore it should be encouraged in every possible way. As a matter of fact, he had been regarded as the sponsor of the inhalation into the lung view, but he had never taken the pronounced attitude towards that which some people thought he had.

Mr. J. A. F. Wilkinson (Woolwich) raised the point in the definitions agreed between the Master Painters and the Home Office, that a lead compound was defined as a substance which contained more than 2 per cent. of its weight of metallic lead, present as lead sulphate or white lead. That at once introduced a difficulty, because it was obvious that red lead did not come under that definition at all. He thought it was a pity that the Master Painters had not adopted the Government test, which, although it had been criticised, did give something definite to go upon.

Dr. H. H. Morgan thought there was very little justification for the Government solubility test, apart from the statistics given by Dr. Legge as to the pottery industry. It was an empirical test, and he could see no correlation between it and the physiological effect of lead poisoning.

Dr. Fox, in his reply, said that originally a limit of 2 per cent. was put forward by Professors Thorpe and Oliver, but the matter went to arbitration in connection with the pottery industry, and 5 per cent. was adopted. So far as the application of the test to the paint industry was concerned, he thought it would be looked upon as a works test, and if in practice, at times, the amount were found to be 5·5 per cent. or 6 per cent., he did not suppose anything would be said. It was no use concentrating on the minutiæ of these tests, and it must be treated as a matter of practical politics.

Randy's Reflexes.—(V)

Colloids and the demd Donnan Equilibrium

" Is she took bad ? "

" It ain't no name for it. They set up with her all night, Miss Mary Jane said and they don't think she'll last many hours."

" Only think of that, now. What's the matter with her ? "

I couldn't think of anything reasonable, right off that way, so I says : " Mumps."

" Mumps, your granny ! They don't set up with people that's got the mumps."

" They don't, don't they ? You better bet they do with *these* mumps. These mumps is different. It's a new kind, Miss Mary Jane said."

" How's it a new kind ? "

" Because it's mixed up with other things."

" Well, what in the nation do they call it the *mumps* for ? "

" Why, because it *is* the mumps. That's what it starts with."

" What other things ? "

" Well, measles and whooping cough and erysipelas and consumption and yaller janders and brain fever and I don't know what all."

" My land ! And they call it the *mumps ?* "

" That's what Miss Mary Jane said."

* * * * * *

" Is it *ketching ?* Why, how you talk ! Is a *harrow* catching—in the dark ? If you don't hitch on to one tooth, you're bound to on another, ain't you ? And you can't get away with that tooth without fetching the whole harrow along, can you ? Well, these kind of mumps is a kind of harrow, as you may say—and it ain't no slouch of a harrow, nuther, you come to get it hitched on good."

We emerge from our temporary eclipse feeling that we are no longer aquatic neophytes. We have crossed the line and enter upon what we are encouraged to hope is a vast region of hydrono-dynamic potency, greatly refreshed by our dowsing—we will not say, in mere water, the word is too simple and has too little bite upon the jaded palate of the chemist ; let us term it " activated, energy-absorbing " water, if only to placate Bonian susceptibilities. Fortified with the hydronous cocktails administered by our clamant neo-Neptune, we now start out on a fresh series of studies.

" Mazin' how folk get kind of 'sorbed in a subject." The good Henry seems to be fair gone on his goddess and we must confess that she has a pleasing plumpness. Perhaps, in the fully clad form in which she is offered, she will appeal even to the most orthodox of Aberdonian professors and may serve as a refresher from formal phrase rule studies.

We have to thank him for the candid exposition he has given of his views. Whether he be our friend or our foe—maybe he will at times be the one, at times the other—we shall doubtless be glad, on occasion, to drink, even deeply perhaps, at the Pierian spring of his hydrous enthusiasm. He has made us wise on sundry debateable counts and we hope that now and then he will invite us to a discussion-tea, which we may attend un-feed, for friendly interchange of opinion. If he be in any way justified in his contention, the ionic mark of the dissociation currency should be rapidly depreciated and its minus idol'ic value generally recognised in the market places of the scientific world, without forced occupation of its *Ruhrs*. Return may be contemplated even to a gold coinage of common experiment, guided by reason and a controlled imagination—to a time, not too distant, we trust, when

> Our singing *shall* build
> In the void's loose field,
> A world for the spirit of wisdom to wield.

We wonder ! Meanwhile, imitation being the sincerest form of flattery, we have clipped our cumbrous title, in appreciation of his acumenous hint, to one more conformate with the character of our essays.

To return to colloids. Their character, to our thinking, is painted to perfection in the fragments of conversation we quote from the well-known American classic to which our hoary friend has happily led us. The wisdom of Huck Finn's reflexions, their close application to the subject of our consideration, may not at once be apparent—but it is there. Colloids *is* mumps—the real pluribus-unum variety of Mary Jane's Uncle Harvey. Very " ketching "—harrows incarnate ; perhaps we should say, gelatinate. Remains to justify this diagnosis * * * * * * as the great Wells would say.

Graham began their study ; after him—*longo intervallo*, Emil Fischer intervening—came Hardy, a name of old repute, formerly known to every boy coupled with that of Nelson—even in the *Dynasts*. To Nelson's great lieutenant's descendant we owe the observation that a *neutral* protein just won't move in an electric field. Give it a chemical shove, put temptation in its path in the form of a little acid or a little alkali, it at once starts wandering, like Japhet in search of a father, this way or that, either to the negative or to the positive electrode—to the former if acid, to the latter if alkaline : a victory over indifference equal to any won by his sailor forefather over the French fleet. Unfortunately, Hardy diagnosed *these* mumps, as a sailor and an electrician would, not as a chemist ; he therefore spoke of the neutral compound as isoelectric protein—just as bad as calling mumps erysipelas ! He did what the doctors always do—used a term to which common folk (and physical chemists) could not attach an instructive meaning. So his discovery did not catch on.

A good many years later Jacques Loeb came along ; he said Patterson'ly : " (But) You blighters (or—' You but blighters ') who have messed about with colloids, have all failed to notice that sometimes you use the substance itself, sometimes an acid-salt, sometimes an alkali-salt—so your results are all over the shop, not to be interpreted in any rational way. You never can tell—whether you start from scratch or not ; you never settle your handicap." Just as well might one study caustic soda made from salt and silver hydroxide without ascertaining whether and what proprotion of original salt the product contained.

Loeb made a variety of simple comparisons, taking care either to start from scratch or to know the " real-acidity " handicap of his colloid : so it came about that he obtained rational results. He wrote paperette after paperette, always with the same beginning and the same ending. Fortunately, he has collected these into a most valuable little book. Unfortunately, he has only half extricated himself from the ionic dissociation morass, so he uses the jargon of the cult ; in addition, following Hindu example, he has established a new worship, that of the " Donnan-equilibrium," as he is pleased to call it. We are sure that we shall have Mr. Mantalini's sympathy in calling it " the demd-Donnan-equilibrium "—we are so tired of being eternally told that it is at the bottom of everything colloidal. It is the first instance on record, we fancy, of a modern Irishman being made into a Deity. Hitherto Scandinavian or Teutonic Gods have monopolised the attention of the pious among chemists.

Now, as to the nature of the " demd equilibrium " : given a septum through which B can pass but not A—a door to which A can find no key : placing on the one side a solution of A, on the other a solution of B, only this latter will traverse the septum. At osmotic equilibrium, the proportion of B will be greater on its lone side : on the other, the more there is of A, the less there will be of B, the greater the disproportion of lone B to B keeping company with A.

Such osmotic balance, being one-sided as to its cause, is properly termed *an asymmetric equilibrium*. We propose so to speak of it, being of the opinion expressed in a recent *Blue-bits* editorial, " that it is most devoutly to be hoped that there will be no extension of the increasing custom of labelling reactions (a thinking chemist would say—interactions) or theoretical deductions with the names of their authors." Of course, it is nice to pay compliments—but they cut no clear ice in the ocean of memory.

Loeb, each time he introduces the concept, is at the pains to restate its terms, usually at considerable length and in mathematical form, yet without ever making clear, in ordinary parlance, what the state of affairs contemplated really is. Verily is

> ' Learning a cobweb of the brain,
> An art t' incumber gifts and wit
> And render both for nothing fit.'

The conception is by Donnan out of Thermodynamics,* clearly one of the philosophies (phrase rules) adumbrated by Omar in the well-known lines :

* It is far easier gotten out of common sense.

'Myself when young did eagerly frequent
Doctor or Saint and had great argument
About it and about; but evermore
Came out by the same door wherein I went.'

Working with pot-hooks and hangers, it is a discipline which never gets us anywhere on the road of explanation and understanding, any more than does the statement of a bank balance disclose the nature of a business. We prefer to state the case simply, by pointing out that the said "demd equilibrium" is merely the outcome of the law promulgated by the Duchess, when, moralising on the mustard-mine, she sharply told Alice "The more there is of mine, the less there is of yours," the great law of nature, which governs the world and is at the bottom of present economic troubles—to be thought of in connexion with oil-mining millionaires and profiteers generally; what the agriculturists, when they talk big and wish to produce the bamboozling effect of thermodynamics upon their innocent hearers, call the law of diminishing returns; what most people have in mind, in its inverse form, when mourning their investments.

Loeb would have us leave phrase physics and turn our attention to classic chemistry, so we may well keep company with a classic character. Let us then worship the Duchess rather than Donnan, the while saying, "We thank thee, O Professor, for directing our attention to the verities.'

Life itself clearly depends upon the maintenance of asymmetric equilibria, so the subject is one of commanding importance.

Parenthetically, we may point out that acceptance of the concept involves recognition of the fact that solutions are solutions and the solute a dissolved, controlled substance—not an unnatural, van't Hoffian, gaseous libertine. Gases decline to share the accommodation at their disposal; once inside an enclosure, each pushes its way about just as if it were monarch of all it surveyed. Hydrogen separated from nitrogen by a palladium septum behaves at first just as potassium chloride does towards potassium ferrocyanide on one side of a septum impermeable by the latter—one of cupric ferrocyanide, for example. The hydrogen is only controlled while in solution within the septum; forming a dissociable compound with the metal, just as the chloride does with the water, it gradually edges its way through, equally prepared to go either way, just as the chloride is; eventually it is equally distributed on the two sides of the septum and is entirely unmindful of the knocks it gets from the nitrogen molecules; in fact, it adds its knocks to those of the nitrogen molecules but only the poor walls of the container suffer. There is no Maxwellian demon, corresponding to the hydrone molecules visualised by the good Henry as controlling agents in an aqueous solution, to keep it in order. This difference is one to ponder over, between gaseous pressure and the osmotic effect—in reality a negative pressure. Hydrogen is subject to the effect while on its travels through the palladium. And the cause? We have it from the Duchess, "'tis love, 'tis love, that makes the world go round"—only the chemist calls it affinity, though of late he thinks of this as the loves of the electrons. The *leit-motif* is certainly neither knocks nor suicidal mania.

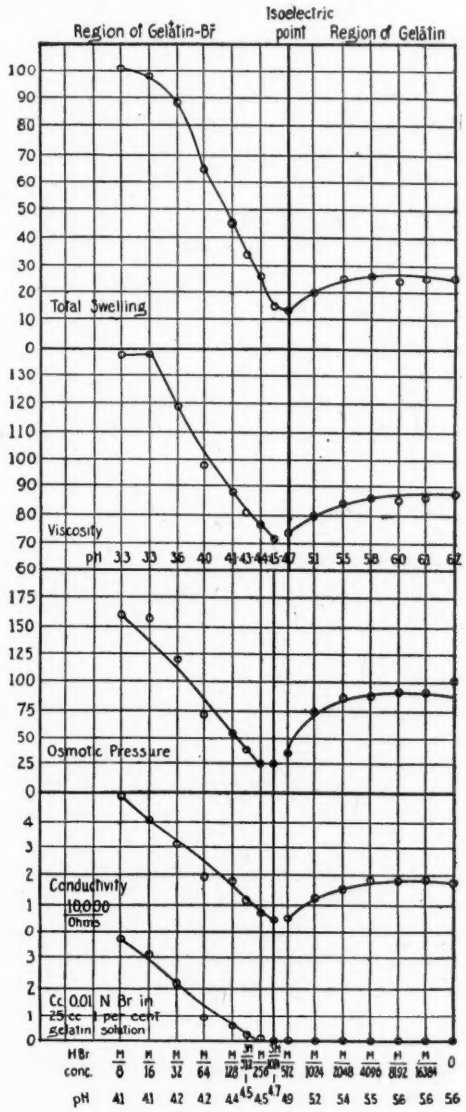
To conclude, the conditions in a solution seem to be analogous with those in a strictly monogamous state, in which, at a given time, the number of marriageable males is definitely limited and only the equivalent number of females can marry; the more of one type attract mates, the fewer of another or other types are able to secure partners.

"We are the plaything of the winds"; it is also undeniable that Truth is great and will prevail. We are prompted to these remarks by the reflexion that it has fallen to the lot of Donnan, a prominent supporter of the doctrine of irresponsible molecular suicide and ionic individuality (in solution), to introduce a conception which practically invalidates such doctrine.

A Hair perhaps divides the False and True!
Yes; and a single Alif were the clue—
Could you but find it—to the Treasure House
And, peradventure, to the Master, too.

The suggestion is now made that the master force in aqueous solutions is not suicide-mania but hydrone and that whatever subdivision of molecules take place is at its instance and rigidly controlled by it: that the process is one of mating and sharing of nuclei.

We have to consider colloids from this point of view. Let us first take Loeb's evidence, that the properties of a colloid have their origin at the "isoelectric point," in the substance itself. A glance at the accompanying graphic record, copied from his book, is sufficient to carry conviction on this point.



The material used in the experiments was Cooper's gelatin, which consisted partly of calcium gelatinate. One gram of the powder was kept during 30 minutes at 15° C. in distilled water; other similar quantities were placed in beakers each with 100 c.c. of a solution of hydrogen bromide of concentrations varying from M/8 to M/8192. After 30 minutes, each portion treated was put into a cylindrical funnel and the acid allowed to drain off; the residue was then perfused six or eight times, constantly stirring, with 25 c.c. of water, not above 5° C.—to prevent the granules from coalescing. After the water was finally drained off, the volume was measured, to determine the swelling. Then the gelatin was melted by heating to 45° C.; enough water having been added to make up the volume in each case to 100 c.c., determinations were made of the conductivity, osmotic pressure and viscosity of each solution and of the amount of bromine present. The data are reproduced in the several graphs. It will be noted that the various properties considered tend to a maximum as the gelatin is converted into the bromide salt.

The British Association of Chemists

Review of the Past Year's Work

We give below the substance of the annual report of the Council of the B.A.C., to be presented at the sixth annual general meeting in Birmingham on Saturday, October 27. The report is signed by W. E. Kay (chairman), H. E. J. Cory (hon. treasurer), and I. Boodson (hon. general secretary).

In spite of the financial stringency, progress has been well maintained in the established activities of the Association, especially in regard to the Legal Aid and Unemployment Benefit Funds, and the depression in industry in many ways has served to emphasise the usefulness of the B.A.C. to its members. A committee has been appointed to investigate possible channels for future activities.

Membership

A decrease is again reported in the membership as at the end of the year. This is due mainly to the economic situation in the chemical and allied industries, particularly in the heavy chemical industry, where reductions in salaries have taken place, and, further, to the withdrawal of those members who were opposed in principle to the inauguration of the Unemployment Benefit Fund. That the Association should lose some members for the latter reason was anticipated, but the adoption of the scheme has been amply justified by the results obtained from the first year's working. Forty-two new members have been elected, 221 have resigned or have been removed from the Register under the operation of the rules, and losses due to death number four. The effective membership is thus 912, compared with 1,095 at the commencement of the year.

After consultation with the Section Committees, the Council recommend that no increase be made in the annual subscription for the coming year, and that the system of voluntary donations be continued.

Unemployment Benefit Fund

The outstanding feature of the year's work has been the operation of the Unemployment Benefit Fund. In this the economic aspect of the Association has been brought to the forefront, and the results achieved fully justify the optimistic forecasts of the originators of the scheme. This function of the Association is one which can be undertaken by no other chemical organisation, and for this reason alone should attract the support of the general body of chemists in the country. Members should urge upon their fellow-chemists that, in addition to the general protection of their economic interests, membership of the B.A.C. may be justly regarded as a definite insurance against the hardships attendant upon unemployment.

Appointments Bureau

The Appointments Bureau has been extremely active throughout the year, an average of nearly 10 per cent. of the full membership having received the weekly circular continuously. The work of the Bureau has been extended, and the weekly circular now contains practically the whole of the appointments suitable for chemists which are advertised in the technical Press. In addition, further endeavours have been made, successfully in a number of cases, to induce employers to communicate their requirements direct, whereby several of the members have been placed immediately in appointments. A careful watch is also kept for advertisements of appointments under conditions not consonant with the status of the chemist as a professional man. Direct action has been taken wherever possible in addition to the issue of a warning to the members on the Register. There are at present 72 members on the Active Register, of whom 46 are returned as unemployed. These figures represent decreases of 1 and 20 respectively on last year.

Legal Aid

The Legal Aid Fund is one of the distinctive features of the Association, and the success attending the work of this department during the past year proves it to be one of the most valuable of our activities. The details of the High Court action fought in November last have already appeared, and, in addition, ten other cases, not involving lawsuits, have been dealt with during the period under review. One of the latter was of major importance, dealing extensively with a new agreement of service brought out by a company employing a large number of chemists.

Definition of the Term "Chemist"

Co-operation between the various chemical organisations, coupled with the education of the general public by chemists themselves, would seem to be the solution of the problem of legal re-definition of the term "chemist." The Council are of the opinion that until this has progressed to a much greater degree no useful purpose would be served by an active attempt to obtain a statutory right to the title, and that any such action would serve only to antagonise the pharmaceutical profession. The question, however, is necessarily affected by the Pharmacy Acts (Amendment) Bill, now before Parliament, and the position is being closely watched by Mr. C. S. Garland, M.P., and the Whitley Councils and Parliamentary Committee, and such action will be taken as is necessary. Proposals were made recently by Dr. E. F. Armstrong for calling a round-table conference between the various chemical organisations and the Pharmaceutical Society to discuss the possibility of agreeing as to the future use of the relative terms "chemist" and "pharmacist." The Council heartily concur in Dr. Armstrong's proposals, and the active support of the Association has been offered to assist in bringing about such a conference.

Propaganda

A fresh propaganda campaign is to be opened at the commencement of the Winter Session, and endeavours are to be made to secure the assimilation in industry of a greater number of scientifically trained men and to bring before the public to a greater degree the intrinsic value of applied science as a national asset. Arrangements have been made for securing the loan of a number of industrial films of great interest to the general body of members. The showing of these films will form part of the winter programme of the sections, and local announcements may be expected in due course.

The activities of the Association during the year have been directed mainly to the furtherance of the economic welfare of the members and to the consideration of those problems outside the ambit of the other chemical organisations. Every opportunity has been taken to foster co-operation between this and the other societies and associations connected with the profession of chemistry. Looking forward to the coming year, it must be realised, however, that the successful issue of any action taken by the B.A.C. must in large measure depend on the numerical strength of its membership, and to this end the Council appeal to the general body of members to concentrate on propaganda work, thereby to consolidate the position of the Association both in the industrial and the professional life of the country.

Therapeutic Substances

At the last meeting of the Council the general secretary drew attention to the Bill which has been introduced into the House of Lords by Lord Onslow to regulate the manufacture, sale, and importation of therapeutic substances. The Bill provides that only licensed persons shall manufacture these substances, and licences are required for importation. The general secretary stated that an attempt was being made in conjunction with Mr. C. S. Garland to secure the insertion of amendments in the Bill placing the processes of manufacture of these substances under the control of properly qualified persons.

Negotiations with N.U.Sc.W.

In the *Bulletin* the negotiations as to union with the National Union of Scientific Workers are reviewed at considerable length. These were discussed fully at a recent meeting of the Council, when it was decided that in any negotiations respecting joint activities and a joint journal provision should be made that, after the termination of twelve months' working, either contracting party should be entitled to withdraw from the agreement upon reasonable notice, and that unless it had been found possible to carry into effect the arrangements for leasing joint or adjacent offices by January 1, 1924, the proposals should lapse.

The Late Dr. J. A. Harker, F.R.S.

An Appreciation

WHEN I received a request from the editor to write a short appreciation of my late partner and friend, I felt it encumbent on me to consent. There is much beside the bare record of high service to science and of devoted patriotism at a time of his country's greatest trial to record, and it is perhaps well that something of this side of Dr. Harker's character should be made known to other than his immediate friends.

I first came into contact with Dr. Harker in the early days of the war, when, as a member of the "Electricity Supply Committee" of the Board of Trade, I was anxious to obtain his help in connection with proposals that had been put forward for the utilisation of peat for power purposes. I was at once struck with his very great enthusiasm, and with his anxiety to help forward the work of reconstruction or development without thought of self.

We remained in close association from our first meeting, comparing notes regarding the work of the various committees on which we were acting.

In 1918 Dr. Harker left England for America on the s.s. *Andania*, which was torpedoed by a German submarine off the coast of Ireland. Many hours in an open boat in bitterly

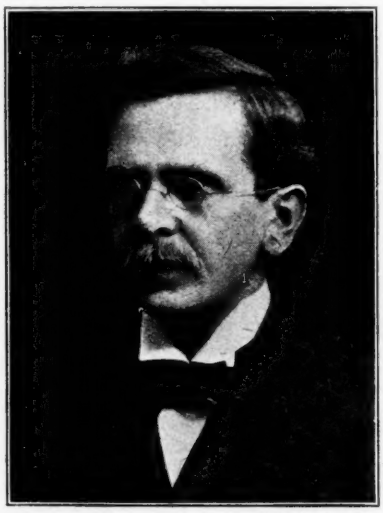


Photo by Lafayette
THE LATE DR. HARKER

cold weather left a permanent mark on a constitution never really robust, and he frequently complained that his health had declined from that date. It was typical of his unselfish thought for others that on this occasion, and notwithstanding his own need, he should have given his coat to a stoker less warmly clad than himself.

From 1916 to 1921 he was Director of Research to the Ministry of Munitions, and a Member and Organiser of the Nitrogen Products Committee. He visited, on behalf of the Government, most of the countries in which developments in nitrogen fixation had taken place, and it was on one of these visits that the above-mentioned incident occurred. He may be regarded, therefore, as a victim of the war which claimed so many brilliant men from science.

When the war ended we decided to continue the close association we had formed, and to join in partnership as consulting engineers. From that date our association was close, and I had many opportunities of confirming the opinion I had formed of his character and his ability. He brought all his old enthusiasm to bear on his new work, and impressed everyone with his transparent sincerity, and his selfless devotion.

It is remarkable that notwithstanding his state of health and his many scientific interests, he should have found time to take a keen part in politics and a real and practical interest in social work. The members of Whitefield's Central Mission will have reason to feel his loss, and the National Liberal Club will miss a familiar figure. "He was," to quote his friend Sir James Crichton Browne, "modest and conciliatory, and was never materialised by his studies." That is much to say of one whose whole life was so wholeheartedly devoted to science, and who had attained such eminence in his work. As the head of a department with which he was actively associated, Sir Frank Heath said, "It had been evident to his friends for some time that the strain of the war had told heavily upon him, and that he was carrying burdens beyond his strength, and he was one of those men who preferred to fall under the load they bear to abandoning the effort before they must."

In parting with him one feels that one has lost not only a loyal colleague but a sincere friend, and the best tribute that can be paid to so devoted a son of science will be to carry to completion in his spirit the works on which he was engaged, confident that this would be most in accordance with his wishes.

J. F. CROWLEY.

Alkali Manufacturers & Gas Undertakings

Board of Trade Inquiry

MR. H. C. HONEY (Director of Gas Administration), during the course of consideration of a Draft Order made by the Board of Trade under the Gas Regulation Act of 1920, on the application of the Brentford Gas Company, on Wednesday, again had before him the question of the insertion of the Model Bill Clause known as the "Residuals Clause." An application for the insertion of this clause, which restricts the gas undertaking from purchasing more than one third of the amount of residual products which it produces itself, in order to prevent undue competition with chemical manufacturers, was made on behalf of the Alkali Manufacturers' Association. The object of the Order in question is to authorise the Brentford Gas Company to purchase the adjoining undertakings of the Harrow and Richmond Companies and also to erect new gasworks upon a large area of land at Greenford. It is in respect of these new works that the application for the insertion of the residuals clause was made.

Mr. Tyldesley Jones, K.C., the leading counsel for the Brentford Gas Company, strongly opposed the application, stating that the Company did not now operate under that restriction, and that as recently as 1919, when the Company was in Parliament, the restriction was not put upon them.

Mr. Honey asked why it was that the Alkali Manufacturers' Association did not ask for the insertion of this clause in 1919.

Mr. W. A. Clark (Messrs. John Kennedy and Co., Parliamentary Agents), said that the 1919 Act was in fact promoted in 1918 whilst the war was still on and it was not thought patriotic then to do anything to hamper the supply of munitions. The result was that the Alkali Manufacturers' Association left it to the authorities of the House to do as they pleased. There were, however, he contended, very special reasons why the clause should be inserted in the present case. The Brentford Gas Company was now becoming one of the very large gas companies of the country and it was to restrain the large gas companies from embarking upon extensive chemical manufacturing operations that the Model Clause had been drafted and inserted in so many Acts of Parliament. He, therefore, strongly urged the Director of Gas Administration to insert the residuals clause in this Order.

Mr. Tyldesley Jones, K.C., said the reason why the clause was not inserted during the war was that it was found that the manufacture of high explosives was being seriously retarded by the protection which the alkali people had succeeded in getting during times of peace, when nobody foresaw the war. This country was in very great peril for a long time on account of the insertion of this clause in various gas Acts. He was going to ask the Director of Gas Administration definitely to refuse to insert this clause and he invited the Association of Alkali Manufacturers to raise this matter on the floor of the House of Commons in order that Parliament might have an opportunity of expressing an opinion upon it. It was about time that this protection for the Alkali Manufacturers' Association, which nearly produced irreparable injury to this country during the war, was removed. It was perfectly monstrous; the public interests had been absolutely sacrificed to a ring of alkali manufacturers and it was time Parliament had an opportunity of altering this state of affairs.

Report on Oxygen Research

The Storage of Liquefied Gases in Vacuum Vessels

THE Oxygen Research Committee has now submitted to the Advisory Council of the Department of Scientific and Industrial Research a report on the present state of knowledge in regard to the storage of liquefied gases, the manufacture of metal vacuum vessels, the use of vacuum vessels, and the transport of liquefied gases. (Report of the Oxygen Research Committee, H.M. Stationery Office, 8s. 6d. net.) It has been found impracticable to make this, as had been hoped, a complete handbook of oxygen, but, nevertheless, the amount of the work done for the Committee is supplemented by a considerable volume of general information on the subject not hitherto collected in any one work. The first part of the report, in particular, dealing with the general theory and practice of vacuum vessels used as storage vessels for very cold liquids, and based largely on monographs by the late Dr. J. A. Harker, gives an unusually clear, as well as complete account of the fundamentals of the subject, and with the special physical data collected in the appendix is probably the best and most convenient description available of the principles and methods of applying liquid gases.

Metal Vacuum Vessels

For direct practical use the section on the manufacture of metal vacuum vessels will be found particularly important. When the war increased the demand for vacuum vessels and reduced the possibility of tender handling—as, for instance, in their indispensable provision for service in aeroplanes—users were compelled to look to metal vessels to give something nearer than glass to the required robustness. The vacuum vessel and the use of charcoal and other absorbents, which made the use of metal possible without an inadmissible loss of liquid gas, were the inventions of the late Sir James Dewar, following directly on his researches at the Royal Institution on the liquefaction of gases, but the manufacture of both glass and metal vessels before the war was an exclusively German industry. The necessary knowledge of practice, and to some extent even of theory, required for manufacture had thus all to be gained, and this was the more difficult because the vacuum required for efficient insulation of liquid air or oxygen is higher than anything previously much used in manufacturing practice—about one-ten-thousandth of a millimetre, normal atmospheric pressure being 760 millimetres—and the vacuum was liable to be destroyed by leakages, evolution of gas absorbed at the surface of the container, porosity of metal, and the like, to an extent never previously met.

Even the theory of evacuation by the use of absorbents had still to be worked out, and among the most important results of the Committee's work has been, not only the elaboration of a method whereby unsound vacuum vessels can be eliminated before evacuation, but also the establishment of data that show how the time for evacuation and the duration of pumping can be reduced to a fraction of the previous figures. As a result, it is now possible to evacuate six vessels in little more than the time previously required for one, and much less pumping is called for than was thought necessary before the Committee's work had thrown its present light on the mechanism of evacuation.

Vacuum Vessels in Use

A variety of experience and experiments has confirmed the need for the use of absorbents. The great increase in their activity produced by lowering their temperature has shown that they greatly simplify the manufacture by making it possible to produce a thoroughly satisfactory vacuum in use—that is, one in which loss of contents by conduction is almost negligible—when at the time of sealing off at atmospheric temperature the vacuum is no more than perhaps one millimetre. With such a vacuum the sort of loss to be expected per day would be of the order of 5 per cent., with a 25-litre metal vessel under normal conditions, more for smaller and less for larger vessels, as against about 20 per cent. for 500-gallon cylindrical tanks lagged with magnesia. During transport, the rate of evaporation from vacuum containers increases with agitation, and may exceed by a good deal the evaporation from a stationary lagged tank without any evacuated envelope. The examination of vessels that have been in use for considerable periods shows that there is a progressive decay of vacuum, which, however, is relatively slow for the more modern vessels. The reason for this is not yet clear, and is still under investigation.

It does not appear that the limit has yet been reached to which evaporation can be reduced by suitable design and manufacture, and from the experience of the last few years' work it may be hoped that it will be improved in the future. The practical application of this method of insulation is not likely to go much further in practice until its production is placed on a more stable foundation than it is at present.

Owing to the better heat-insulating properties of glass vacuum vessels, a case was devised to carry these without exposing them to shock, and this was tested rigorously as to its suitability for aeroplane work, but in no case was it found that the glass could be sufficiently protected to prevent breakage, so further work was not done in this direction. It was necessary to find the most satisfactory method of transferring liquid air and oxygen from one vessel to another and, in view of the narrow necks of the metal vessels which had to be filled, a device known as the pressure syphon was found to be the most suitable. This resembles in principle the ordinary wash bottle used by chemists.

The concluding sections of the report deal with the different means available for the transport of liquefied and compressed gases, and with physical data such as boiling points, specific and latent heats of liquefied gases.

Success in Chemical Practice

Address by the President of the Institute

"SUCCESS in Chemical Practice" was the subject of an address which Mr. A. Chaston Chapman, F.R.S., President of the Institute of Chemistry, delivered on Thursday, October 11, to the Bristol and South Western Counties' section of the Institute. Mr. R. D. Littlefield, F.I.C., presided over a large attendance in the chemical lecture theatre at Bristol University. The Chairman extended a very cordial welcome to Mr. Chapman. He mentioned that the section had sent a message of congratulation to Sir Ernest Cook on the well-merited honour conferred upon him by the King.

Mr. CHASTON CHAPMAN said that success was, as a general rule, regarded as synonymous with fortune, and measured in terms of money. A man, however, might be very wealthy, and yet, without the good opinion of his friends, his wealth would bring him little happiness and success of only a very limited kind. In speaking of a chemist, he placed the general recognition of his scientific and professional attainments and the respect and esteem in which he was held by his colleagues as the measures of success. A chemist who thus received recognition was not likely to lack the material rewards of his industry. He assumed that he was addressing chemical students in various stages of their careers. The first essential for success was love of the subject that they were making their life's work. It must not be a means of livelihood, but the only means for them. If they could cheerfully say they would rather have £500 a year as chemists than a much larger income in any other career, then they had made the right choice, and the first elements of success were there. No man really did his best in work that was distasteful to him. The chemist, like the poet and the artist, was born and not made. Like all professions chemistry made heavy demands on its followers. No man who desired to make a mark could afford to watch the clock. Other points in Mr. Chapman's address included the following:—

Success in a modern profession is almost as much a matter of constitution as mental equipment.

Go in for sports, but don't overdo them.

Have good food and a decent lunch.

You cannot work hard and play hard at the same time, for it means nervous prostration, which will follow you all your life. Therefore, don't burn the midnight oil too much over work or amusement.

Above all, observe the unexpected result. I wonder how many great discoveries have been missed in an unexpected result that was disregarded?

Never assume the book must be right and you must be wrong.

The man who keeps his bench in a mess often has his mind in the same condition.

Read good English literature, and learn how to express your thoughts in well chosen language.

Read as many biographies of great scientific men as possible.

Conditions of British Chemical Industry

An American Correspondent's Impressions

MR. PAUL WOOTON of Washington, who was recently in this country investigating industrial conditions, contributes the following notes on the chemical industry to *Chemical & Metallurgical Engineering* :—

Great Britain is determined to have a representative chemical industry. The public is displaying an interest and is backing up the effort to a degree not so much in evidence in the United States. Where formerly a place in the Navy was sought for the boy who displayed the greatest intellectual promise, the tendency in the United Kingdom now is to place him in the chemical industry. It is regarded that there he has greater personal opportunities and is in a position to contribute most to the empire's defence.

Great importance is being attached to research. Substantial progress of a scientific character has been made in nearly every branch of the industry.

The best work since the war seems to have been done on fine chemicals, but this is probably due to the fact that the British were well advanced in the manufacture of heavy chemicals in 1914. Even in that line of endeavour, however, there were many gaps and much dependence on Germany. This was brought home very forcibly early in the war by the lack of facilities for the manufacture of fuming sulphuric acid —a situation which might well have been attended with serious consequences.

Public is Behind the Industry

The British are demonstrating their temperamental fitness for chemical manufacture and the public is thoroughly convinced that the industry is essential to national vitality. Free trade England has been willing to do much more for the safeguarding of its chemical industry than has the United States, which is normally protectionist.

The public sentiment behind the British chemical industry may be accounted for in part by the fact that manufacturing is the predominant activity of the British Isles. The sudden severance of trade with Germany at the outbreak of the war found so many plants in immediate danger of having to suspend production through the lack of some essential chemicals that it was brought home to all manufacturers that a certain amount of self-sufficiency is a wise precaution. Moreover, there is a very general realisation that the chemical industries to-day offer the most promising field for large and profitable development.

While the British industry has enjoyed a greater measure of public support than has been the case in America, the industry here has had the advantage of a greater degree of confidence on the part of the bankers. New World bankers, accustomed as they are to support pioneering in one form or another, have given a much greater measure of support than did British bankers. There is very general resentment because of the lack of co-operation on the part of the financial interests. During the critical times of the deflation period in 1921, the banks all but deserted the industry, and even to-day they are pursuing a reactionary policy toward it. The industry has met this shortage of liquid assets by standing together unselfishly. There are many instances where a concern has helped a competitor through a financial emergency. As a result, there is a new spirit of internal confidence in one another and a sense of stability that might otherwise have been lacking. While the policy of the bankers has delayed the expansion of the industry, it certainly has increased its morale and its confidence in itself.

Sir William Alexander, the chairman of the British Dyestuffs Corporation, Ltd., who during the war was the General charged with the direction of the national explosives factories, told the writer that had the armistice been delayed even a week, bombs containing 1,000 lb. of T.N.T. would have been dropped on Rhine cities. Since the next war will begin where the World War left off, there is no doubt in Great Britain that the next struggle will be largely a chemical one. The British do not expect to be found helpless if they are forced to participate in it.

The British industry does not expect to be safeguarded legislatively for an indefinite period. The manufacturers declare that they will not be satisfied with the protected home market. They have no ambitious dream of dominating the markets of the world. It is very apparent that they recognise that others will have a share in supplying the world's requirements. They expect powerful competition from America, but they are convinced that it will be a fair and friendly rivalry which will make for the advancement of the art and for the increase of the world's capacity to absorb chemical products.

German Competition Expected

The English expect Germany to come back into the market as a powerful competitor but with such loss of prestige that no chance exists for her to regain her former position. This prediction is based on the fact that Germany's trade was built on unsound foundations. The consumers of the world had been influenced by skilful propaganda to believe that German chemists had no equals and that Germany's manufacturing processes could not be duplicated. Then, too, the Germans held over the heads of consumers the fear that they might be denied new products if they traded elsewhere.

The consumers of the world now have learned that others can make as good dyes and other chemical products as can the Germans. They recognise that the extensive programme of research going forward in the United States and in Great Britain is as likely to be productive of new products as are any efforts of the Germans.

In the matter of research, the British industry has just had something of a shock, caused by the rather summary resignation of Dr. Arthur G. Green from the important post of director of research and chief chemist of the British Dyestuffs Corporation, Ltd. The trouble apparently was difference of view as to the amount of research that should be conducted. Under present conditions of demand, the directors of the corporation were not ready to accept Dr. Green's entire research programme. A majority of the directors were willing to sacrifice some research at this time in favour of an effort to secure greater manufacturing and sales efficiency. There can be no question that British manufacturers have a correct appraisal of the value of research. Their ideas in that direction are more generous than are those of some large American interests. The differences with Dr. Green are not interpreted in England as an indication of any lack of faith in research as a major activity. The question involved was simply one of how far the corporation could afford to go at this particular time.

The Value of Government Research

ON Wednesday, at the session of the Industrial Economic Council, the Marquis of Salisbury, Lord President of the Council, spoke on the subject of co-operation for technical research and information. Lord Salisbury said the whole attitude towards research as a Governmental effort had changed a great deal in the course of the last twenty years. It had become more and more accepted that the business of research was really an essential element in the industrial progress of the country, and there had grown up in Great Britain a Government organisation for research, beginning with very small beginnings, but gradually spreading, gradually developing, and, he hoped, perfecting its organisation. This big field of research extended in all directions—science, medicine, industry, commerce all contributed to this work, and he thought it would be admitted, notwithstanding that they all believed in private enterprise in this, as in many other things, that a measure of Government intervention and action was requisite. In commercial and industrial work great care had to be taken not to attempt to rival private enterprise. In a large measure the work of private enterprise was likely to be more efficient than Government work in those matters, *i.e.*, in all research which led up to direct commercial profit. It was more likely that the great firms which worked would achieve their ends more economically and efficiently than a Government department; but on the other hand the Government had access to advantages which were not possessed by private enterprise.

What they were anxious to do was to share everything that they possessed in these respects with the great Dominions and Colonies beyond the seas. It was not altogether unselfish on their part, because they wanted it to be mutual, and they wanted to get from the Dominions beyond the seas all that they could contribute towards the common stock. The Government research organisation was run on strictly business lines. It was not only effective, but it was economical, and he believed it was the only department under the Government on which the axe did not fall in the recent inquiry.

Silicate of Soda in Soap Manufacture

Silicate of soda is one of the most valuable of the materials which are added to soap, and the following notes on the manufacture of silicate soaps are based on a statement issued by the Philadelphia Quartz Company, U.S.A.

GENERAL household or laundry soaps should have several special qualities. They should have sufficient "strength" or cleansing property to act readily on the grease and other dirt which they are ordinarily used to clean, but should not be so strong that they will injuriously affect the hands, or fabric or their colours. They should dissolve easily in water, but even in hot water the cakes should not become so soft that they will be used wastefully. They should be as inexpensive as possible. Silicate of soda properly used helps to give soap all these qualities.

Silicate of soda is a mild alkali, and is, therefore, itself a cleanser. In some laundries a certain amount of silicate is regularly used in the washers. The addition of silicate to soap adds to its cleansing power. A soap containing silicate makes up into firmer cakes than if made without silicate, and the cakes last longer in use. They do not soften down in hot water so much, and there is therefore less waste and greater satisfaction to the soap user. Silicate of soda is one of the least expensive of all the ingredients that go into soap. It, therefore, brings down the average cost of the soap. Silicate is, in fact, the main thing that makes it possible to have inexpensive household soaps.

Grades of Silicate

Silicate of soda consists of the alkali soda, combined with a mineral product, silica. Different grades of silicate of soda contain different relative amounts of soda and silica, as well as different amounts of water. "N" Brand silicate, a grade largely used by soap manufacturers in the U.S.A., is a syrupy liquid testing 41° Baumé. Its analysis is as follows:—

Soda (Na_2O)	18 per cent.
Silica	29·0 per cent.
Water	62·1 per cent.

The amount of soda in "N" Brand is equivalent to 11·7 parts of 76 per cent. caustic soda. The amount of water, although it looks large, is in fact only just about enough to keep the silicate from hardening up; if one-tenth of the water dries out, the silicate will stiffen up to a hard jelly, and as more water dries out it will become more and more glass-like.

Soap makers in other countries prefer a heavier, thicker, more alkaline silicate. A grade supplied for this trade is as follows:—

Soda (Na_2O)	8·9 per cent.
Silica	36 per cent.
Water	46 per cent.

This amount of soda is equivalent to 23·7 parts of 76 per cent. caustic.

The heavier silicate is relatively more expensive than the "N" Brand, and as it is very thick it is less convenient to handle. But where freights are excessive it may be more economical to use the highly alkaline and more concentrated grade.

The Action of Silicate in Soap

The animal and vegetable fats and oils used in soap making are combinations between fatty acids and glycerin. Soaps are essentially combinations between these fatty acids and alkali, either soda or potash. In boiled soaps the glycerin which is separated by the alkali is drawn off, and in cold process soaps it is retained in the soap. The kind of stock affects the character of the soap, and many different mixtures of grease stock are in use. Household soaps often contain rosin, which also combines with alkalis. All soaps contain water and carry certain amounts of other substances.

If an amount of "N" Brand silicate of soda is incorporated in soap while it is being made, it will readily mix in and as the soap cools and stiffens the silicate stiffens up with it. The water which the silicate contains is merged with the water which the soap contains, and as the soap dries out the whole mass becomes uniformly hardened. The silicate in the course of drying tends to become harder than the soap would naturally become, so that the use of silicate, as was stated above, makes the soap firmer. This action makes it possible to produce soap with satisfactory working qualities from fats or formulæ that would otherwise make too soft a soap.

In the process of mixing with the soap and hardening, "N" Brand silicate takes to itself some additional alkali out of the soap. One hundred pounds of "N" Brand silicate will take up the equivalent of 5·85 pounds of 76 per cent. caustic soda. As a boiled soap is run from the kettle it should, therefore, contain enough excess alkali to combine with the silicate on this basis, and the formulæ for cold soaps must be worked out in the same way.

Silicate in Boiled Soaps

The raw soap is made in the usual way, by boiling with weak lye ("killing change"), graining with brine and settling, boiling up with strong lye ("strengthening change"), graining with additional strong lye, and settling. Rosin can be included if desired ("rosin change").

The details of the formulæ used and of the process of handling vary greatly according to the stocks that are available and the results desired. The following gives one formula and process, which can be taken as typical:—

100 parts tallow
30 parts cottonseed oil.

Boil with weak lye (8° to 10° Baumé) until it will not take up any more. Open with salt or brine. Settle and run off the settlings to be worked for glycerin. If rosin is to be used, next run in lye of 18° to 20° Baumé and boil up, adding the rosin and additional lye as may be required. Open with brine and run off the lye.

After the rosin change is run off, or if no rosin is used, after the stock change, add lye for the strengthening change, at 13° to 14° Baumé if closed steam is used, or 20° to 22° if open steam. Boil, adding fresh lye as required. A "head" or foam will rise on the surface of the soap; continue boiling until the foam disappears and the soap settles to a smaller space in the kettle. The soap should be in a pea grain, and lye thrown up by the boil should settle down quickly through it. When the soap reaches this point it has taken all the strength that it will combine with. Add water and boil with open steam; the soap will thin out. Boil until the soap is of uniform conistency, adding water gradually. When it reaches the point that the soap is thin and the lye will separate on a paddle it is done. Settle over night and run off the lye under the soap into a tank for future use. Finish the soap in the usual way, taking care to leave enough free alkali to combine with the amount of "N" Brand silicate that is to be added. The soap at this stage should contain about 31 per cent. water.

The soap at a temperature of 185° to 200° F. is run into the crutchers. While crutching, from 20 to 25 pounds of "N" Brand silicate per 100 pounds of this raw soap usually can be mixed in. Larger amounts can sometimes be used. The silicate should be at a temperature of about 85° to 110° F. Various conditions, such as the kind of fats used, the temperature of the raw soap and of the silicate, and other special points which the soap maker learns by experience, affect the amount that can be incorporated in the soap. When everything is right the maximum amount that can be used is considerably higher than the above mentioned figures.

The soap is run from the crutchers to the frames at about 140° F. Frames are usually stripped after about 48 hours and the soap allowed to stand three days before cutting.

Silicate in Cold Process Soap

In the cold process of soap making, instead of prolonged boiling of the fats with weak lye, settling, reboiling, etc., as above outlined, the whole process is carried out in a crutcher, in a single operation and in a very short time. The exact quantities of fats, strong lye and other ingredients required are carefully weighed or measured out, and everything that goes into the crutcher remains in the soap. There is no spent lye to drain off and the glycerin is retained in the soap.

The equipment required for the cold process is much less than for boiling, as no kettles are needed and no steam.

Many formulæ are in regular use, but the following may be taken as typical :—

FORMULA No. 1.

75 lb. Tallow.
25 lb. Cocoanut oil.
75 lb. Caustic soda lye, 35½° Baumé made of 76 per cent. caustic.
125 lb. " N " silicate of soda.
20 lb. Pearl ash lye, 36° Baumé.

320 lb. Soap.

FORMULA No. 2.

75 lb. Tallow.
25 lb. Cocoanut oil.
70 lb. Caustic soda lye, 35½° Baumé made of 76 per cent. caustic.
100 lb. " N " silicate of soda.
17 lb. Pearl ash lye, 36° Baumé.

287 lb. Soap.

Refined cottonseed oil up to 30 per cent. to 50 per cent. can be substituted for an equal weight of tallow, if the tallow is hard. If the tallow is soft or mixed with grease, use less oil. The soap will not be quite so hard and will take longer to harden, but it will be a good washing soap. In these formulæ the amounts of caustic are calculated so as to include the proper excess for the silicate to take up.

Three weighing tanks are usually arranged, one to supply the exact amount of grease stock, another for the exact amount of lye, and the third for the silicate. With the silicate is mixed the pearl ash lye.

The whole amount of grease stock is first run into the crutcher. Its temperature should be about 145° to 150° F. in cold weather and 125° to 130° F. in summer. The crutcher is started and then the whole amount of the lye is quickly run into the grease and the mixture crutched rapidly until it begins to thicken up. This marks the beginning of the reaction between the fat and the alkali, and is accompanied by considerable heat. The whole amount of the mixed silicate and pearl ash lye is then run in rapidly. As this mixes with the soap the whole will thin out. The crutching is continued, and in a few minutes the whole mass will gradually turn creamy. When the soap is thick enough for a mark made on it to remain, it is quickly dropped into a frame and the frame moved immediately to the spot where it is to stand to cool.

The formation of the soap goes on to some extent in the frame while standing, and it is particularly important that the frame should not be moved or shaken until the soap is cold. The whole process is a quick one, taking from ten to fifteen minutes.

Cold Process Soap from Fatty Acids

When fatty acids are used for making soap, prolonged boiling with weak lye and the separation of the glycerin of course are unnecessary as the glycerin has already been taken out. Fatty acid soaps are therefore made similarly to the regular cold process soap. There is this important difference, however, that the fatty acids will combine with soda ash, so that soda ash is largely used instead of caustic soda. This has the advantage of being cheaper than caustic. Some care must be used to guard against trouble from foaming, due to the release of carbon dioxide (CO_2) from the soda ash.

The details of fatty acid soap making are varied, depending upon the stocks and processes used and the kind of soap to be made.

Sometimes a lye is made up of caustic soda dissolved in silicate of soda. In this case considerably more silicate can be incorporated in the soap than is possible in ordinary boiled process soaps.

Oil Refineries Closing Down

REPORTS to Bureau of Mines at Washington show that 41 oil refineries throughout the United States have been compelled to close since the beginning of the year. Plants in the mid-continent section have been most affected because of their inability to compete with cheap California petrol. In January there were 301 plants in operation, and at the end of August only 260. Since the latter date a number of additional refineries have shut down.

Does Canada Prefer France?

To the Editor of THE CHEMICAL AGE.

SIR,—Before the Overseas premiers return from the Imperial Conference to their various Dominions, it would be useful if we could all come to a clearer understanding about the policy underlying the Franco-Canadian Convention which came into force at the beginning of last month. The effect of certain concessions made by Canada in that agreement to France has been to reduce the preference on British goods as compared with French, a trading advantage which at the moment is being very considerably emphasised by the cheapness of the franc. The first result of the situation is most interesting. A syndicate of French manufacturers have already set up in Canada a dyehouse where grey goods imported under the Convention may be coloured in the Dominion. A needless blow, that is to say, is being delivered, not only at our textile trades, but at British dyestuffs precisely when this young industry is taking the road to real prosperity.

The frank opinion of the Imperial Conference upon the whole question would certainly be illuminating. New Zealand's views would, in particular, be valuable, for there a " depreciated currency duty " has just been adopted to allow Britons a reasonable chance of competing for business in British markets.—Yours, etc.,

FRED. W. ASTBURY.

14, St. Peter's Square, Manchester,
October 15.

Rubber Manufacture

AT the opening meeting of the session of the Bristol Section of the Society of Chemical Industry, on Tuesday, October 9, a paper was read by Mr. J. F. Reid, giving " An Outline of Rubber Manufacture." The chair was taken by Mr. M. W. Jones, chairman of the section.

In the course of his lecture, which was illustrated by slides, Mr. Reid stated that rubber, whether from plantation or from wild trees, was obtained by coagulating the fluid which flowed when the bark was carefully cut. The fluid, which was termed " latex," was not unlike cream or milk, and could be coagulated by various methods. In the Amazon district the latex was coagulated by dipping into it paddles, which were then held over a smoky fire. Plantation rubber was obtained by the addition of acetic acid to the latex. On standing the rubber separated and was finished by washing, milling, and drying. The coagulated rubber then had to be treated in various ways, of which the commonest was " curing " with sulphur or vulcanising. The vulcanised rubber was then forced through machines to form tubing, strips, etc., and then vulcanised again by heating in a bed of French chalk. The calendered rubber produced in this way varied in thickness from 0·01 in. to about 0·1 in., and articles of any thickness could be built up by adding the required number of layers. They could then be cut approximately to shape and vulcanised in a steel mould, under hydraulic pressure. Rubber was not moulded as one cast lead or steel, as open heating destroyed the material. The most recent invention, however, employed a solution of rubber which was poured into a mould, the rubber rendered vulcanisable and the solvent dried off.

Glycerin as a Seal for Liquefied Hydrogen

ONE of the difficulties which the United States Bureau of Standards has encountered in the liquefaction of hydrogen is the securing of hydrogen of sufficient purity. If other gases are present, they become frozen at a temperature higher than that at which hydrogen liquefies. This clogs up the apparatus and stops the process. The storing of hydrogen in any kind of a gas holder is, therefore, a matter of some difficulty because gases are very apt to diffuse through the liquid seal used in the holder and become mixed with the hydrogen. Experiments were made during recent months on the relative rates of diffusion of nitrogen through glycerin, machine oil and water. It was found that the rate of diffusion through glycerin is very much lower than through water or machine oil. This was to be expected because of the extremely low solubilities of nitrogen and other gases in glycerin. The bureau now proposes to employ glycerin as a seal for the gas holder used for the temporary storage of pure hydrogen.

The Institute of Chemistry

President's Address to the Liverpool Conference

IN opening the conference of the Institute of Chemistry, held in the Chemical Lecture Theatre of the University of Liverpool, on Thursday, Mr. A. Chaston Chapman, F.R.S., the President of the Institute, said that he believed that the scheme of holding such meetings would prove to be of the greatest service both to the Institute and to the profession. The suggestion came from the Liverpool Section and the Council received it with warm sympathy and approval, because they felt that many members were not brought so imtimately as could be wished into contact with the headquarters in London. The human touch was of supreme importance in professional life and the Institute should constitute a true brotherhood. This idea was in the minds of the Council when they introduced the admission ceremony by which the new member is brought into touch with the President and Council or with the Chairman and Committee of a Local Section. The Conferences, however, would provide opportunities for members to put their views, their ideals, and—if they have any—their grievances directly before members of Council, with the assurance of a sympathetic hearing.

The Work of the Council

The President proceeded to inform the members upon the work of the Council and the great variety of matters with which they had to deal. He knew of no society or professional body which made a greater demand on the time and energy of its officers, and their work was rapidly increasing in scope and in volume. Nothing had impressed him more during his term of office than the keenness of the Council. Their devotion and enthusiasm were meeting with their due reward. Comparing the position of the Institute to-day with that of a few years ago, they could show a good record of continuous and ever accelerating progress. The Institute claimed its proper position among the great professional bodies and that position was freely conceded on all sides. The President illustrated the extent to which the services and counsels of the Institute were sought by naming the many and various governmental and public and quasi-public bodies by which the Institute had been recently consulted; it was steadily winning for the profession the high place in the councils of the country to which its supreme importance entitled it. He was glad to remark also upon the close and friendly co-operation which existed among the various bodies interested in the advancement of chemistry and reminded the members of the Chemists' Dinner to be held on October 31.

The record of the Institute was open for all to read and there could not exist, he thought, in any unprejudiced mind, a shadow of doubt that, but for the existence and continuous effort of the Institute, there would have been no profession of chemistry, using the term in its true sense. The Fellowship of the Institute implied not merely a good scientific training and a sound knowledge of general chemistry, but also specialised knowledge and experience, and a guarantee of professional competence and professional character. Moreover, the need for similar organisations had been found in the Overseas Dominions and in the United States where bodies with aims and objects very similar to those of the Institute had recently come into existence.

Working for the Common Good

In all relations of life, while it was the privilege of the individual to receive benefits it was also his duty to contribute all he could to the common good. The more powerful any professional body as a whole became, the greater the amount of service it was capable of rendering to its individual members. Every member should become a centre of propaganda and lose no opportunity of explaining what chemistry really meant and the nature of his work.

In conclusion, the President referred to the Benevolent Fund of the Institute. It was part of the duty of a professional man to help any of his brethren who might meet with misfortune, and he thought that every member should make a small annual contribution in order that in the aggregate the Committee might have sufficient funds to meet all appeals in a satisfactory manner.

Proposed Purchase of Artificial Silk Works

THE directors of J. Mandleberg and Co., india-rubber waterproofers, etc., Pendleton, have called a meeting of shareholders for the purpose of obtaining authority to apply for 60,000 participating preference shares in Harbens, Limited, at par, part of a present issue of 100,000 8 per cent. cumulative first participating preference shares of £1 each. Harbens was incorporated in 1920 with a capital of £300,000, of which only 111,300 £1 shares were issued, with the object of purchasing and equipping works and manufacturing artificial silk. Works at Golborne were bought for about £60,000, and were equipped with special modern machinery (at a further cost exceeding £100,000) for the manufacture of an estimated quantity of five tons of artificial silk per week. When matters had reached this stage the founder of Harbens, Limited (who, with his family, held all the shares in that concern), died, and, as his executors are not prepared to embark upon the manufacture, Harbens, Limited, has never actually begun operations. Following a series of experiments at the works at Golborne, Sir Charles Mandleberg has secured an option on all the assets of Harbens, Limited, and, as money is required to complete the equipment of the works, it is proposed to rearrange the capital of that Company by the conversion of the whole of the 188,700 unissued ordinary shares into 178,700 first preference shares, carrying interest at 8 per cent., and 10,000 second preference shares, carrying similar interest but ranking behind the first preference shares. Of the 100,000 first preference shares 60,000 are offered to J. Mandleberg and Co., and the directors consider that the investment of the Company's surplus funds in this security would not only be a profitable one, but that the acquisition of the shares would be a substantial advantage to the Company, as various processes, such as dyeing, weaving, and waterproofing of the product manufactured by Harbens, are common to both businesses.

A Justification of Poison Gas

BY comparing casualties due to all causes with those due to gas poisoning in the World War, and the relative percentage of deaths in each case, General Henry T. Allen, former commander of the American Army of Occupation on the Rhine, justified to a great extent the future use of gases in case of another war, in an address at the third annual Chemical Industry dinner held in New York, in September, under the auspices of the Salesmen's Association of the American ChemicalIndustry. "Whether poisonous gases shall be used in future wars," he said, "does not depend upon any single State, whatever be its sentiment towards this new weapon. If other States persist in its use, it is absolutely compulsory on our part to do likewise; otherwise we risk tremendous losses in not having the only real antidote—namely, weapons of a similar kind. Unless the world consents to abandon poisonous gases, we cannot. Whether or not this weapon on the battlefield is more inhumane than bullets or shells is indeed a question. It has fallen to my lot to see many victims of both, and I am compelled to say that the difference, if any, is slight."

Electric Smelting of Zinc Ores

THE electric smelting of zinc ores for the production of spelter can now be termed metallurgically feasible, according to Mr. B. M. O'Harra, associate metallurgist of the United States Department of the Interior of the Bureau of Mines. The question of cost then becomes of paramount importance. Up to the present time, the plants in Norway and Sweden are the only ones that have been able to achieve commercial success. Little data on their costs are available, but the plants have been able continuously to maintain and expand their operations during more than 15 years. They are favoured by having very cheap power available, and it is probable that their process would not be commercially practicable in this country. Judging from published reports, their metallurgical results are not as good as have been obtained in much of the work in his country. Mr. O'Harra has begun a study of the electrothermic metallurgy of zinc, under a co-operative agreement between the Bureau of Mines and the Missouri School of Mines and Metallurgy. The results of a preliminary survey of the situation are given in Bulletin 208, which may be obtained from the Department of the Interior, Bureau of Mines, Washington, D.C.

Glasgow Technical College

Sir George Beilby's Resignation of the Chairmanship

AT the annual meeting of the Governors of the Royal Technical College, Glasgow, on Wednesday, a letter was read from Sir George Beilby, intimating his resignation from the office of chairman of the Governors. Sir George wrote that in a recent conversation with Dr. Mackenzie in London he had entered pretty fully into the circumstances which had led to his resignation. There remained nothing now but to communicate his decision to the meeting. Thanks to the cordial co-operation of the vice-chairman and others, the College had come through trying times with increasing prestige. Dr. Mackenzie (who presided), in expressing his regret at this decision, said that Sir George had now permanently settled in London, and was breaking all his connections with Glasgow. All the time that he had been connected with the College, Dr. Mackenzie continued, he had looked to Sir George as a model chairman and an ideal student of research. The Governors passed a resolution regretting the decision and recording their grateful appreciation of the invaluable services rendered by Sir George Beilby during the 16 years of his chairmanship. It was under his inspiration and guidance that the College had entered the new buildings and the Governors had adopted those developments which had led to the recognition of the College as one of the leading centres of technical instruction in the Empire.

On the motion of Professor G. A. Gibson, seconded by Dr. Freeland Fergus, Dr. Mackenzie was appointed chairman. In accepting office, Dr. Mackenzie said they had had eminent scientists and research men in the chair, and he was neither, but his committee experience would stand him in good stead.

The annual report shows the income to have been £68,202. The deficit is £1,780, an increase of £510, which, under the circumstances, is considered satisfactory. The number of students in attendance during the year was 4,972, a slight falling off, due mainly to the completion of their course of study by ex-soldiers training under the Government scheme.

Intimation was made by the trustees of the late Mr. James Smith, formerly a director of the Imperial Tobacco Company, of a legacy to the College of £1,000, which was added to the Endowment Fund. The British Marine Oil Manufacturers' Association made a donation of £105 in token of their appreciation for research work done by the College.

Chemical and Dyestuff Traders

THE British Chemical and Dyestuff Traders' Association announce that samples of goods liable to Key Industry and other *ad valorem* import duties should be despatched by the foreign firm by: Foreign and Colonial Parcel Post, or Insured Box Post, and the contents and value declared. They will then come through without interruption. If posted abroad by sample or letter post they will, on arrival in this country, be seized by Customs and held up. Members receiving "Notice of Seizure" from Customs, of samples of dutiable goods sent by sample or letter post should forward a declaration stating the value of the samples in question. Although Customs have the power to confiscate such packets they will generally agree to deliver same on payment of the duty together with a nominal fine of about one shilling. The above remarks also apply to samples of goods that come under the Dyestuffs (Import Regulation) Act, 1920.

The German Government have withdrawn the decree prohibiting their nationals from applying to the Franco-Belgian authorities for export licences. Trade between this country and the occupied territory should therefore be possible, but the Association understand that German exporters are so far showing little sign of making use of this concession.

The Association has sent in general protests to the Railway Rates Tribunal covering chemicals, dyestuffs, etc. It is pointed out that the proposed new rates are, on an average, 75 per cent. to 100 per cent. above pre-war rates and in every instance show an advance on existing rates. Further, the Regulations governing acceptance of traffic have in many ways been altered to the traders' detriment. Negotiations are proceeding with the Treasury respecting the proposed "bonding" of goods liable to Key Industry duty. The Association have made arrangements for representation in the House of Commons during the coming Session.

Chemical Trade Returns for September

ACCORDING to the official returns issued by the Board of Trade, the imports of chemicals, dyes, drugs, and colours for the month of September last were valued at £1,023,552, which is a decrease of £8,959 on the corresponding month last year, and a decrease on the figures for August of £298,273. The value of exports, however, shows a marked increase, the figure for last September being as high as £2,341,761, which is an increase of £695,905 on August, 1923, and £607,878 on September, 1922.

With regard to the quantities of various products imported and exported, it will be observed from the analysis given below that, though the changes in imports compared with twelve months ago are slight, one or two items show very satisfactory figures on the export side. Sulphate of ammonia exports are up nearly 60 per cent., sulphuric acid and synthetic coal-tar dyes some 180 per cent., benzol and toluol are remarkable for an increase of about thirty-five times on their last year's figures.

Imports for September

INCREASES.		1923.	1922.
Borax	cwt.	3,878	3,003
Calcium carbide	,,	65,526	59,043
Crude glycerin	,,	6,750	6,346
Nickel oxide	,,	1,500	—
Potassium nitrate	,,	27,119	24,343
Unspecified sodium compounds	,,	16,661	16,108
Zinc oxide	tons	522	501
Unspecified painters' colours	cwt.	70,192	49,044
Turpentine	,,	49,203	25,921
DECREASES.			
Acid acetic	cwt.	475	528
Acid tartaric, including tartrates	,,	915	3,821
Bleaching materials	,,	3,907	4,815
Distilled glycerin	,,	152	593
Red lead and orange lead	,,	1,891	3,629
Sodium nitrate	,,	91,408	106,755
Cream of tartar	,,	2,912	3,081
Intermediate coal tar products, including aniline oil, and salt, and phenyl glycine	,,	—	6
Alizarine dyes	,,	171	1,059
Unspecified coal-tar dyes	,,	2,807	5,071
Barytes	,,	52,900	63,237
White lead	,,	7,574	9,835
Essential oils, other than turpentine	lb.	373,923	409,710
Mercury	,,	44,459	90,251

Exports for September

INCREASES.		1923.	1922.
Acid sulphuric	cwt.	2,983	1,020
Acid tartaric, including tartrates	,,	2,003	757
Ammonium sulphate	,,	23,858	14,873
Bleaching powder	,,	28,028	24,376
Anthracene	,,	1,000	—
Benzol and toluol	galls.	142,603	4,048
Naphtha	,,	14,583	1,446
Naphthalene	cwt.	18,122	3,800
Tar, oil, creosote, etc.	galls.	4,580,427	3,701,914
Crude glycerin	cwt.	17,724	266
Potassium chromate and bichromate	,,	3,604	1,153
Potassium nitrate (saltpetre)	,,	882	881
Unspecified potassium compounds	,,	3,171	1,754
Sodium carbonate, etc.	,,	473,801	461,227
Unspecified sodium compounds	,,	50,719	48,099
Zinc oxide	tons	247	209
Coal tar dyes	cwt.	14,313	4,993
Unspecified dyestuffs	,,	7,020	4,513
Paints, etc., ground in oil or water	,,	34,251	15,750
Paints, etc., prepared	,,	31,536	17,085
Paints, etc., unspecified	,,	61,856	45,580
DECREASES.			
Ammonium chloride	cwt.	402	775
Carbolic acid	,,	12,656	19,907
Unspecified coal tar products	,,	22,405	31,028
Copper sulphate	tons	116	554
Distilled glycerin	cwt.	8,195	8,408
Caustic soda	,,	116,180	120,791
Sodium chromate and bichromate	,,	1,927	2,059
Sodium sulphate, including saltcake	,,	157,456	185,235
Barytes, including blanc fixe	,,	2,735	4,903
White lead	,,	16,944	17,289

From Week to Week

MR. LOUIS JOHN HUNT has been elected Prime Warden of the Dyers' Company, and Mr. William Wood Leuchars, Renter Warden.

AT AN INQUEST held on Monday in London on a suicide who had taken lysol, the coroner added a rider to his verdict, that lysol should be scheduled under the Poisons Act.

AN IMPETUS has been given to scientific research in Australia by the opening of new laboratories for the National Philosophy department of the Melbourne University recently.

MR. HENRY SPAHLINGER, of Geneva, whose researches into the treatment and cure of tuberculosis have attracted considerable attention in recent years, arrived in London on Tuesday.

THE LABORATORY APPARATUS at H.M. Factory, Gretna, comprising a large quantity of glassware, thermometers, balances, and general chemical apparatus, is for sale by public tender, closing October 31.

THE THIRD INDUSTRIAL CHEMISTRY CONFERENCE, to be held at the Conservatoire National des Arts et Metiers, Paris, begins on Sunday next and will continue until the following Friday. This country will be represented by a strong deputation.

AT NINE MILE POINT COLLIERY, near Newport (Monmouthshire), notices have been posted stating that owing to the prohibitive costs of working the colliery it will be necessary to close down at the end of the month. Two thousand men will be thrown out of employment.

IN A PAPER read before the Mining Institute of Scotland at the General Meeting at Edinburgh on Saturday, October 13, by Mr. William G. Burt on "Coal Conveyors," some striking figures were given of the economy obtained from various types of conveyors installed in suitable coal seams.

DR. GODFREY, Minister of Health in the Ontario Government, announces that Dr. Banting has made a new discovery of more importance than insulin, of which an announcement will shortly be made to the public. Dr. Banting has been engaged in research work in Toronto under Federal and Provincial grants.

MR. H. G. SMITH has been appointed to a Lectureship in Chemistry at Balliol College, Oxford. Mr. Smith was educated at King Edward VII. School, Birmingham, and was elected to a Brakenbury Scholarship at Balliol in 1919. He gained a First Class in Chemistry in the Final Honour School of Natural Science in July, 1923.

THE AUTHORITIES of the British Empire Exhibition are in favour of discontinuing the practice of granting awards to exhibitors and awarding instead a commemorative medal. Before finally deciding, however, they are taking the opinion of the Dominion and Colonial representatives and of the United Kingdom exhibitors.

THE GORGAS POWER-STATION, in connection with the American Government nitrogen fixation plant at Muscle Shoals, has been sold to the Alabama Power Co. It will be remembered that considerable interest was raised by the offer of Mr. Henry Ford to take over the whole scheme. The nitrate plants alone now remain to be disposed of.

THE COUNCIL OF SHEFFIELD UNIVERSITY have appointed Professor F. C. Lea, D.Sc. (London), M.Inst.C.E., to the Chair of Mechanical Engineering, in succession to Emeritus Professor Ripper; Mr. Morgan H. Evans, B.Sc. (Wales), to an Assistant Lectureship in Physics; and Mr. F. Winks, B.Sc. Tech. (Sheffield), to the post of Student-Research Assistant in Glass.

THE ANNUAL MEETING of the Huddersfield section of the Institute of Chemistry was held at the Queen Hotel last week. A vacancy on the committee was filled by the election of Dr. J. Bruce. An attractive programme for 1923–1924 was outlined. The affairs of the section will be in the hands of the following committee: Messrs. Hodgson, Everest, Paul, Bruce, Robson and Wilson. Mr. T. A. Simmons is the honorary secretary.

GRANTS made recently from the research fund of Emmanuel College, Cambridge, include one to Mr. S. T. Henderson for Chemistry. The Research Studentship of £150 per annum, offered to a student beginning residence in the present term, has been awarded to J. G. H. Frew, M.Sc., Birmingham University, Research Scholar of the Ministry of Agriculture at Rothamsted, 1921-1923, for Research in Agricultural Entomology.

MR. FRANK KAY has resigned as secretary-treasurer of the Emerson Chemical Corporation and has organised his own company under the name of the Barclay Chemical Corporation, with offices and warehouse at 154, Chambers Street, New York, to operate as merchants and importers of industrial chemicals, oils, pharmaceuticals, tinctures and extracts. Associated with him will be Mr. S. L. Gelb, formerly with G. F. Taylor and Co., of New York.

MR. JAMES CHARLES PAIN, head of the firework firm of James Pain and Sons, died on Sunday, at Streatham, aged 86. Mr. Pain was seventh in descent from William J. Pain, who established in the reign of Charles II. the undertaking which now makes fireworks of every description, ships' night distress signals, fog signals, life-saving rockets, and appliances of like nature. The business will be carried on in London by his son Philip, and in America by his son Henry.

SIR WILLIAM BRAGG lectured at the Birmingham and Midland Institute on Monday on "The Crystals of Organic Substances." He said the physics of the last 25 years had been extremely interesting because scientists had now got two new "tools" that enabled them to see directly or indirectly the atoms and their structures. Two atoms of carbon were the unit pattern of a diamond. Two atoms of aluminium and three of oxygen, put together in a certain way, gave them the unit of pattern in a ruby or sapphire. A slight rearrangement of the pattern unit in the diamond gave graphite.

THE ANNUAL MEETING of the South Staffordshire and Warwickshire Institute of Mining Engineers was held on Monday at Birmingham University, Edmund Street, the chair being taken by the President, Professor W. S. Boulton. A membership of 166 was reported, and it was announced that the financial position was sound, the credit balance having been increased. Professor Boulton was re-elected president, Mr. S. F. Sopwith vice-president, and Mr. G. D. Smith secretary. At the conclusion of the meeting, Mr. J. Ivor Graham read the second of two papers he has given on "The Oxidisable Constituents of Coal."

THE COMMITTEE appointed by the American Chemical Society to deal with the question of the recent gift of 25 thousand dollars annually from the Allied Chemical and Dye Corporation has recommended that the prize shall be known as "The American Chemical Prize" (founded by the Allied Chemical and Dye Corporation). The prize will be awarded annually to that chemist (man or woman, a citizen or a resident of the United States of America at the time) who, in a certain year, or through a period of years, has made a contribution of high merit, or in some marked way has promoted the betterment of society, through the science of chemistry. Chemists engaged in any division of their science, including the teaching of chemistry, are eligible for the prize. A Jury of Award consisting of seven members will select the recipient annually.

AT A MEETING of the Council of the University of Liverpool on Wednesday the following resolution was passed, the members of the council standing:—"That the council, while expressing its deep regret at the death of Dr. Edmund Knowles Muspratt, formerly President of the Council and Pro-Chancellor of the University, wishes to record its great appreciation of the long life so largely given up to public service, and more especially to the service of the University. It remembers that such service extended over a period of nearly 40 years, for he was a member of the University College Council from the first, and his connection with the University itself lasted almost to his death. The council would specially acknowledge his long and strenuous work in the founding and developing of the University. It remembers his wisdom in council and his sympathy with all sections of University activity, and it is grateful for his many and generous benefactions. The council desires to express to Sir Max Muspratt and to the other members of his family its deepest sympathy in their bereavement."

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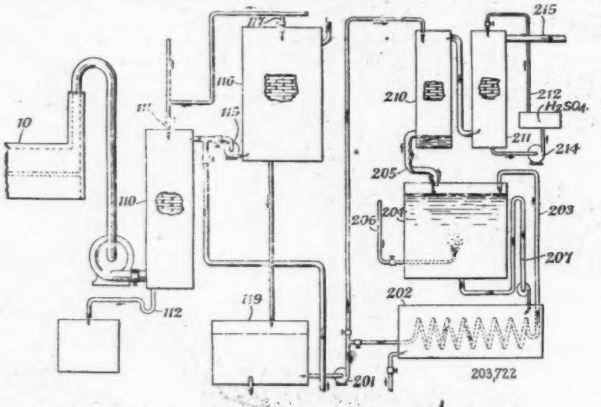
Abstracts of Complete Specifications

203,720. COLLOIDAL DISPERSIONS, PRODUCTION OF. J. F. Moseley, 62, Whitby Road, Fallowfield, Manchester. Application date, March 8, 1922.

Volatile organic solvents such as hydrocarbons and substituted hydrocarbons such as chlorinated hydrocarbons, may be obtained in uniform and stable dispersions in combination with saponaceous material by incorporating them with colloidal silicates or suspensions of silicates, with or without alkalies, borax, etc. Suitable silicates are ehrenbergite, bentonite, china clay, blue or ball clay, killas and like clays, and silicates of sodium and magnesium, either alone or with peptising agents such as alcohols or phenols. Silicates such as bentonite produce colloidal suspensions by stirring in water, but other silicates may be treated in known manner to convert them into the colloidal state. In an example, trichlorethylene is mixed with a fatty acid such as ricinoleic acid, a colloidal silicate suspension, and caustic soda, and the whole is agitated to produce a uniform dispersion. These products are suitable as detersive agents for vegetable and animal fibres, etc. Reference is directed in pursuance of Section 7, Sub-section 4 of the Patents and Designs Acts, 1907 and 1919, to Specifications Nos. 4226/1882, 3025/1894, 16,448/1907, 106,197 and 162,691.

203,722. METALLURGICAL GASES CONTAINING SULPHUR DIOXIDE, TREATMENT OF. A. E. White, London. From American Smelting and Refining Co., 120, Broadway, New York. Application date, March 10, 1922.

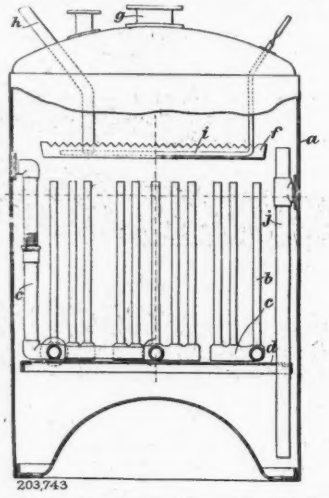
The apparatus is for recovering sulphur dioxide from metallurgical gases obtained as a result of smelting, refining, and converting processes, on materials containing copper, lead,



zinc, iron, etc.; it is particularly applicable for treating gases containing a relatively small proportion of sulphur dioxide. Gas from a converter or other source 10 is passed into a cooling and scrubbing tower 110 having a cold water inlet 111 at the top, and a draw-off pipe 112 at the bottom for heated water. The gas is withdrawn by a fan 115 and passed into an absorption tower 116. The tower 110 is adapted to cool the gases and remove dust, but to remove the minimum quantity of sulphur dioxide, while the tower 116 is supplied with cold water at 117 to remove the maximum proportion of sulphur dioxide. The solution thus obtained is collected in a tank 119, from which it is withdrawn by a pump 201 and forced through a heat exchanger 202. The solution is heated in this apparatus nearly to its boiling point by hot water obtained from a subsequent step in the process. The solution then passes through a pipe 203 to a boiling vat 204 where the absorbed sulphur dioxide is liberated. The solution may be heated by steam injected through a pipe 206. Gas passes out through a pipe 205 to a cooling tower 210, and thence to a scrubbing tower 211, where it is subjected to the action of sulphuric acid. The acid in this tower is circulated by means of a pump 214. The dry sulphur dioxide gas passes on through a pipe 215 to a compressor, where it is liquefied. Part of the cold liquor is not passed through the heat exchanger 202; it is forced through a pipe 212 to the top of the cooling tower 210 to cool the hot gas. The heated liquid is returned to the boiling vat 204. The quantity of cold liquor thus used is regulated so that it is heated nearly to its boiling point, while the gas is cooled to about 60° F. In this process, no fresh water is used for cooling purposes, and all the liquor entering the boiling vat is at a relatively high temperature. Further, the waste liquor from this vat is passed through the pipe 207 to the heat exchanger 202 to heat the incoming cold liquor. The economy in steam and pumping costs thus obtained renders it practicable to treat metallurgical gases containing only a small proportion of sulphur dioxide. A modified apparatus is also described in which an intermittent supply of gas having a highly variable content of sulphur dioxide is used for the production of a constant supply of sulphur dioxide solution of a constant sulphur dioxide content. In this apparatus, the gas from the cooling tower is passed to a tower where it meets a solution of sulphur dioxide in spray form. The gas is thereby enriched, and is passed into an absorption tower where it meets the liquid which has been partly freed from sulphur dioxide. The absorption liquid is continuously circulated in the system until it reaches the required strength, when it may be treated by the apparatus described above.

203,743. DISTILLATION OR EVAPORATION OF LIQUIDS. J. L. Major, 12, Norfolk Street, Strand, London. W.C. Application dates, May 13 and July 8, 1922.

This apparatus is for the continuous distillation or evaporation of liquids such as crude petroleum or tar, by which the liquid is fed to the still through a number of pipes extending



upwards through the liquids in the still, the lighter vapours being disengaged from the liquid on emerging from the pipes. The inlet pipes *b* are mounted on supply conduits *c* supported on a frame *d*, and connected to a supply conduit *e*. The pipes *b* are open at the top, and the lighter vapour discharged from them impinges against a horizontal tray *f*, and finally escapes through the outlet *g*. The vapour is then passed to a dephlegmator, the liquid from which is returned to the tray *f* through a pipe *h*. The liquid in the tray is heated by a steam coil *i* and overflows into the still. The liquid is discharged from the still by means of a pipe *j* open at both ends. In a modification, the top of each pipe *b* may be provided with a dead weight valve, and in another modification the upper ends of the tubes *b* may be connected in groups to common discharge chambers, the outlets from which are provided with dead weight valves.

203,749. ALKALI SILICATES. W. Clayton, "Arderry," Allerton Drive, Mossley Hill, Liverpool, and H. W. Richards, 9, Hawarden Avenue, Wallasey, Cheshire. Application date, May 18, 1922.

The object is to obtain sodium silicate in solid form, which is readily soluble in water. Sodium silicate solution tends to

[*Continued on page* 431]

[*Continued from page* 430]

gelatinise when evaporated, while the product obtained by melting sand and soda ash and then grinding is not completely soluble. In this invention, commercial water-glass solution is diluted to 100° Tw., warmed, and sprayed with air at high pressure into a chamber containing heated air. It is found that if the usual concentrated solution of 140° Tw. is used, considerably more power is required to atomise it owing to its much greater viscosity. In an example, the silicate solution is heated to 45° C., and sprayed by means of air at 65 lb. per square inch pressure into the top of the chamber containing air heated to 110° C. The process yields a granular product which is readily soluble in water.

203,798. ALUMINA FROM SULPHATE OF ALUMINIUM, METHOD OF MANUFACTURE. A Hurter, 46, Stanhope Gardens, Kensington, London, S.W.7. Application date, June 15, 1922.

In this process, crude aluminium sulphate is treated to obtain a mixture of alumina with the impurities, and the latter are subsequently removed. The aluminium sulphate is heated in reducing gases such as hydrogen, and it is found that if the temperature is kept below 500° C., the alumina obtained is soluble in acids, particularly in sulphuric acid The sulphur is driven off as sulphuretted hydrogen and sulphur dioxide. Any sulphate of iron contained in the aluminium sulphate is reduced by means of the hydrogen to iron, iron sulphide, and iron oxide. The product may then be treated with weak acids to dissolve out the iron, and the pure alumina may then be dissolved by heating with stronger sulphuric or hydrochloric acid. The alumina thus obtained may be used for the electrolytic production of aluminium, since it is more readily soluble in fused cryolite. In an example, kaolin is heated to 800° C. until most of the alumina becomes soluble in acids. The temperature is reduced, sulphuric acid is added, and the mixture reheated until the silicic acid is insoluble. Aluminium sulphate is then dissolved out with water, and crystallised. The sulphate, which contains about 2 per cent. of iron sulphate, is heated in hydrogen to 500° C., and the iron then removed by means of dilute hydrochloric acid, leaving pure alumina soluble in acids. In a modification, the reducing gas is mixed with oxygen, air, chlorine etc., so that the heating may be effected internally. The iron may be extracted by means of weak sulphuric or nitric acid, iron or aluminium chloride solutions, or by heating with chlorine, sulphur chloride, etc. The iron may be distilled off in the form of iron chloride.

203,812. FORMIC ACID DERIVATIVES, PROCESS FOR PRODUCING. J. Y. Johnson, London. From Badische Anilin and Soda Fabrik, Ludwigshafen-on-Rhine, Germany. Application date, June 20, 1922.

Carbon monoxide and ammonia are caused to react at a pressure above 20 atmospheres and a temperature above 100° C. Catalysts such as pumice stone, clay, earthenware, alumina, copper, or water may also be added, and the products are formamide or ammonium formate, or both. A small quantity of moisture is advantageous in the production of formamide, and water is necessary in the production of ammonium formate. In an example, carbon monoxide is forced into liquid ammonia in an autoclave to a pressure of 150 atmospheres. The temperature is raised to 200° C., and the pressure increases to 230 atmospheres, and then diminishes to 170 atmospheres. The mixture is cooled, the pressure released, and the formamide produced is purified by distillation. Mixtures of ammonium formate and formamide may be produced in a similar manner, the proportions depending on the quantity of water present. The carbon monoxide may be employed mixed with other gases, such as hydrogen or nitrogen, but in this case the pressure must be correspondingly higher. The autoclave must not be of iron or tin, which are attacked by the reagents.

203,820. ARYL ESTERS OF PHOSPHORIC ACID, MANUFACTURE OF. A. G. Bloxam, London. From Chemische Fabrik Griesheim Elektron, Frankfurt-on-Main, Germany. Application date, June 27, 1922.

Aromatic hydroxyl compounds, whether carbocyclic or heterocyclic, are treated with phosphorous oxyhalide to obtain aryl esters of phosphoric acid. The esterification is more complete, and occurs at a lower temperature, if the reagents are also mixed with a small proportion of calcium, magnesium, or aluminium, or their chlorides, or a halogen compound of a metal of the chromium or iron group. Indifferent solvents or diluents, such as benzene, toluene, or chlorobenzene may also be added. In an example, a mixture of phenol 282 parts, and aluminium chloride 1·5 parts, is treated with phosphorus oxychloride 153 parts at 65°–70° C., rising finally to 110° C. The triphenyl phosphate obtained is washed with dilute alkaline dye. Other examples are given of the production of paratricresyl phosphate, the betanaphthyl ester of phosphoric acid, the resorcin ester of phosphoric acid, the 2:6-dioxynaphthalene ester of phosphoric acid, the 8-triquinolyl ester of phosphoric acid, the phenyl-dibetanaphthyl ester of phosphoric acid, and also the esters of other carbocyclic and heterocyclic hydroxyl compounds such as those of chlorophenols, nitrophenols, alphanaphthol, other dioxynaphthalenes, other oxyquinolines, etc. These products are used as softening agents in the cellulose and other industries.

203,824. ARYLOXY NAPHTHYLKETONES, MANUFACTURE OF. O. Y. Imray, London. From Soc. of Chemical Industry in Basle, Switzerland. Application date, June 30, 1922.

Substances having the formula R-C=Cl_3, in which R represents an aromatic nucleus, which may be substituted, are caused to react with betanaphthol in the absence of a substance adapted to neutralise an acid or with a derivative of α- or β-naphthol having one or more negative substituents. As examples of the first class of compounds, phenyl-chloroform or a substitution product thereof or 1-chloro-2-naphthylchloroform may be employed. These aryloxynaphthyl ketones have the general formula R-CO-R^1, in which R^1 is an oxynaphthalene nucleus which may contain one or more negative substituents. These products are soluble in alkalies to a yellow solution, and in concentrated sulphuric acid to a yellow-brown solution. Examples of the production of 1-phenylketone 4-oxynaphthalene-3-carboxylic acid and several other compounds are given.

203,963. CEMENT FROM BLAST FURNACE SLAG, MAKING OF. W. R. Cochrane, 38, West Campbell Street, Glasgow. Application date, November 23, 1922.

Blast furnace slag is mixed with sufficient calcium carbonate, chalk, or limestone to make up the deficiency in lime. The mixture is crushed by means of heavy gravity stamps or steam hammers working in a mortar, or by crushing rolls. By this means the vitreous structure of the slag is more completely broken up than by a grinding process. The mixture is then floated into a wash mill and kept suspended in water by stirring, to separate the soluble calcium sulphide. The mixture is then run into settling tanks and the residue is calcined in kilns in the usual way and then ground to the required fineness.

International Specifications not yet Accepted

202,299. ZINC, RECOVERING FROM ORES. Electrolytic Zinc Co. of Australasia, Ltd., 360, Collins Street, Melbourne, Australia. International Convention date, August 8, 1922.

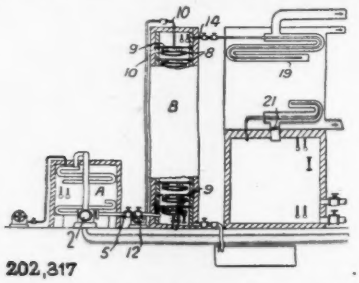
The ore is roasted and leached with spent electrolyte, and the residue mixed with strong sulphuric acid. The mixture is dried and heated in a furnace in contact with gases containing sulphur dioxide, to a temperature sufficient to decompose iron sulphate, but not zinc sulphate. The product is then leached with part of the previous leaching solution. The first leaching product is classified and the slimes thickened and decanted, and the residue filtered for the acid treatment. The coarse material is treated by flotation, and the tailings added to the slime residue, while the concentrates are roasted to obtain the gases for the furnace treatment. The leaching solutions are treated with limestone to precipitate iron and silica, and are then returned to the cells.

202,311. HYDROCARBONS. Soc. Ricard, Allenet et Cie., Melle, Deux-Sèvres, France. International Convention date, August 9, 1922.

Ethylene hydrocarbons are passed through a suspension of anhydrous aluminium chloride in petroleum ether to obtain polymerised liquid hydrocarbon mixtures. The gases are preferably under pressure. If ethylene is to be polymerised, butylene is first passed through the suspension. The aluminium chloride compound is then treated with water and rectified to recover the petroleum ether. The products may be cracked to obtain lower boiling products, and may be hydrogenated. Butylene may be polymerised at ordinary pressure.

202,317. Converting Hydrocarbon Oils into Oils of Lower Boiling Point. H. K. Berry. Brooklyn, New York. International Convention date, August 10, 1922.

¶ The liquid hydrocarbon is supplied by a pump 12 and pipe 10 to the top of a tower B, where it is distributed over hollow or solid bodies 8, separated by plates 9 having central apertures. Hydrogen, water gas, or natural gas is forced by a compressor 2 through a tubular furnace A to the bottom of the tower B, so that it passes over the film of oil on the members 8. The



202,317

pressure is such that the lowest boiling fraction of the oil will vaporise and combine with hydrogen without decomposition or cracking. The temperature at the bottom is sufficient to vaporise the highest boiling fraction, and that at the top is the boiling point of the required end product. The vapour passes into a condensing pipe 14 and the uncondensed gas is expanded through a valve 21 into the surrounding pipe 19 to cool the pipe 14.

202,613. Colloidal Sulphur. H. Vogel, Premnitz, near Rathenow, Westhavelland, Germany. International Convention date, August 16, 1922.

To obtain highly dispersed sulphur hydrosols, sulphuretted hydrogen and sulphur dioxide are passed in finely divided form through water at $-3°$ to $+4°$ C. The formation of polythionic acids is decreased and the yield of colloid is increased by using an excess of sulphuretted hydrogen. The dispersions are kept out of contact with air.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention: —177,174 (A. J. B. Jouve, A. Helbronner, and Soc. Hydro-electrique and Metallurgique du Palais) relating to manufacture of chromates, see Vol VI, p. 668; 181,391 (L. Lilienfeld) relating to dyeing of alkyl celluloses, see Vol VII, p. 249; 181,392 and 181,395 (L. Lilienfeld) relating to cellulose ethers and derivatives, see Vol. VII, p. 249; 183,816 (Naamlooze Vennootschap Philip's Glocilampenfabriken) relating to manufacture of tungsten powder, see Vol. VII, p. 462; 185,729 (J. Gradl) relating to artificial manures, see Vol. VII, p. 684; 187,603 (T. J. Brewster) relating to obtaining acetic acid from pyroligneous acid, see Vol. VII, p. 943; 193,012 (Allmänna Ingeniörsbyran H.G. Torulf) relating to sintering fine ores, see Vol. VIII, p. 433; 201,123 (Soc. des Condenseurs Delas) relating to evaporating, distilling and concentrating apparatus, see Vol. IX, p. 320.

Latest Notifications.

205,066. Distributing apparatus for the supply of fuel to ceramic furnaces or the like. Monnier, A. October 4, 1922.

205,078. Preparation of heavy and light magnesia hydrate. Monterumici, R. October 3, 1922.

205,081. Manufacture of silicic acid gels. Farbenfabriken vorm. F. Bayer and Co. October 4, 1922.

205,100 and 205,101. Distillation of carbonaceous substances. Kohlenveredlung Ges. October 5, 1922.

205,103. Process for making pure table salt in conjunction with electrolysis of salt solutions. Angel, E. G. R. October 6, 1922.

Specifications Accepted, with Date of Application

177,536. Cellulose ester and process of forming the same. A. W. Phillips. March 24, 1921.

182,488. Cellulose esters, Solutions of. Nitrogen Corporation. July 2, 1921.

182,803. Ammonia and benzol hydrocarbons, Process and apparatus for separating—from coal distillation gases. Ges. fur Kohlentechnik. July 7, 1921.

183,123. Mordant dyeing colouring matters, Manufacture and production of. Durand et Huguenin Soc. Anon. July 15, 1921. Addition to 166,530/1921.

187,592. Hydrogen sulphide, Process for the production of. H. Howard. October 20, 1921.

189,136. Alcohol, Continuous process and apparatus for the production of large quantities of absolute. E. Barbet et Fils et Cie. November 15, 1921.

190,694. Cellulose esters, Method of treating. Nitrogen Corporation. December 23, 1921.

192,703. Urea from cyanamide, Process for the manufacture of. Soc. d'Etudes Chimiques pour l'Industrie. February 4, 1922.

204,349. Machines for disintegrating and emulsifying materials. H. Povey and H. O. Hallas. March 29, 1922.

204,363. Separation of gases from liquids, Apparatus for. H. Wade. (*W. S. Elliott.*) May 29, 1922.

204,393. Pigments and pigment compositions. W. J. Mellersh Jackson. (*American Cotton Oil Co.*) June 27, 1922.

204,458. Heavy hydrocarbons, mineral oils, oil residues, tars or the like, Process for the catalytic cracking of. Erdol-und Kohle-Verwertung Akt.-Ges. and E. Erlanbach. August 1, 1922.

204,495. Ores or the like, Treatment of—by flotation processes. A. C. Vivian. September 1, 1922.

204,514. Intermediate products, Manufacture of—and their application for producing fast dyeings on the fibre. W. Carpmael. (*Farbenfabriken vorm. F. Bayer and Co.*) September 16, 1922.

204,528. Para-dichlor-benzene and chloranthraquinone, Manufacture or production of. H. Dodd, W. C. Sprent, and United Alkali Co., Ltd. September 29, 1922.

204,543. Peroxides of nitrogen, Electric apparatus for the production of. F. Stacey. October 14, 1922.

204,559. Crystals from solutions, Process of and apparatus for obtaining large and uniform. E. Passburg and H. Griffiths. October 25, 1922.

204,579. Retorts or stills. F. Lamplough and N. C. T. Harper. November 14, 1922.

204,594. P-nitrophenetole from P-nitrochlorbenzene, Manufacture of. W. Lewcock and Gas Light and Coke Co. December 2, 1922.

204,662. Borneol and Isoborneol. J. Schindelmeiser. April 6, 1923.

Applications for Patents

Amalith Chemische Industrie Ges., Deutsch, L., and Thorn, I. Process of hardening products of condensation from phenols and aldehydes. 25,274. October 10 (Austria, November 30, 1922.)

Amalith Chemische Industrie Ges., Deutsch, L., and Thorn, I. Production of products of condensation from phenols and aldehydes. 25,275, 25,276. October 10. (Austria, November 30, 1922.)

Barrett Co. Purifying hydrocarbons. 25,292. October 10. (United States, November 3, 1922.)

Bishop, C. A., and Lilleshall Co., Ltd. Centrifugal filters, separators etc. 25,093. October 9.

British Cellulose and Chemical Manufacturing Co., Ltd., and Ellis, G. H. Treatment of cellulose derivatives. 25,111. October 9.

British Cellulose and Chemical Manufacturing Co., Ltd., Croft, C. M., Ellis, G. H., and Stevens, F. M. Treatment of cellulose derivatives. 25,348. October 11.

Coignard, A. J. Obtaining a deposition of chromium by electrolysis. 25,584. October 13.

Coke, B. E., and Maxted, E. B. Hydrogenation of naphthalene. 25,312. October 11.

Crundall, S. F. W., and Spence, H. Production of titanium compounds. 25,328. October 11.

De Wendel et Cie., Les Petits Fils de F. Process for preparation of explosive charges by means of liquid oxygen or air. 25,484. October 12. (France, June 4.)

Dutt, W. Purifying manganese ores. 24,968. October 8.

Empson, A. W. Centrifugal separators. 25,587. October 13.

Farbwerke vorm. Meister, Lucius, and Brüning. Manufacture of condensation products of the anthraquinone series. 25,482. October 12. (Germany, October 12, 1922.)

Farbwerke vorm. Meister, Lucius, and Brüning. Manufacture of mono-azo dyestuffs. 25,483. October 12. (Germany, October 12, 1922.)

Hoffmann-La Roche and Co., Akt.-Ges., F. Manufacture of emulsions of bismuth salts. 25,478. October 12. (Switzerland, November 1, 1922.)

Klages, A., and Saccharin-Fabrik Akt.-Ges. vorm. Fahlberg, List and Co. Manufacture of mercurial phenols. 25,299. October 10.

Levy, L. A. Manufacture of cellulose acetate. 25,254. October 10.

Llewellyn, W. B., and Spence and Sons, Ltd. Production of titanium compounds. 25,328, 25,329. October 11.

Morris, E. E. Pulverising or emulsifying apparatus. 25,334, 25,335. October 11.

Scott, A. C. Explosives. 25,140. October 9.

Soc. of Chemical Industry in Basle. Manufacture of naphthalene derivatives and of dyestuffs therefrom. 25,043. October 8. (Switzerland, November 18, 1922.)

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to* THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers ; those interested in close variations in prices should study the market report.

London, October 18, 1923.

THE improved demand recorded in our last report has been maintained and quite a fair volume of business has been transacted. Prices are exceedingly steady and some products are inclined to be in rather short supply.

General Chemicals

ACETONE has been in good demand. Price unchanged.
ACID ACETIC is a shade easier, but in good demand.
ACID CITRIC is idle.
ACID LACTIC is exceedingly scarce ; market firmer.
ACID OXALIC.—Stocks are light and price unchanged.
ARSENIC has been in brisk demand on export account.
BARIUM CHLORIDE is unchanged.
FORMALDEHYDE is in slightly better supply. Price unchanged.
LEAD ACETATE is inclined to be scarce. Price firmer.
LEAD NITRATE.—Slightly higher prices are being quoted.
LIME ACETATE.—Firm and in restricted supply. Price may go higher.
LITHOPONE.—More business has been passing and the market is firm.
CAUSTIC AND CARBONATE OF POTASH.—Without change.
PRUSSIATE OF POTASH.—A reduction is announced.
SODIUM ACETATE is in steady demand. Price without change.
SODIUM HYPOSULPHITE COMMERCIAL is in slightly better request. Price unchanged.
SODIUM PRUSSIATE shows no change on the week.
SODIUM SULPHIDE is in better request, both on home and export account. Price firmer.
ZINC SALTS are unchanged.

Pharmaceutical Chemicals

ACETYL SALICYLIC ACID is in good demand and advancing steadily. Some Continental manufacturers are now asking considerably higher prices for forward delivery.
ACETANILID is higher in the weak.
AMIDOPYRIN is a firm market, having been in steady demand for export.
BROMIDES.—A steady improved business is reported.
GUAIACOL CARBONATE has advanced rapidly, with still higher price in prospect.
HEXAMINE is firm and in fair demand.
MILK SUGAR.—Isolated parcels are still offering at cheaper prices. The general outlook is firm.
PHENACETIN.—Dealers report a good business on a firm market.
PHENAZONE.—Active—leading makers have withdrawn from the market, having apparently sold their entire output well ahead.
SALOL in demand ; the higher figure has been readily paid for spot supplies.
SODA BENZOATE is inclined to harden, but has not been in great demand.
SODA SALICYLATE is in steady request, top prices being freely paid for the best brands.

Coal Tar Intermediates

This market during the past week has been distinctly quiet, but few inquiries have been received on one or two particular lines.

ALPHA NAPHTHOL continues firm with stocks short.
ALPHA NAPHTHYLAMINE is steady.
ANILINE OIL is unchanged and some home orders have been booked.
ANILINE SALT has been a fair home business at recent prices, with strong export inquiry in the market.
BETA NAPHTHOL has been the object of export interest.
BENZIDINE BASE.—Chiefly a home trade.
DIMETHYLANILINE.—Foreign buyers are distinctly interested.
"H" ACID.—Chiefly home business to report.
METANITRANILINE is without special feature.
NITRO BENZOL has been a small home business at recent values.
PARANITRANILINE is chiefly of interest on home account.
XYLIDINE.—Export inquiries have been received.

Coal Tar Products

There is no great change in the market for coal tar products from last week.

90% BENZOL is fairly well sold for export at a moderate price. The value on rails remains at about 1s. 4d. per gallon.
PURE BENZOL is in poor demand, and is quoted at 1s. 7d. to 1s. 8d. per gallon on rails.
CREOSOTE OIL is unchanged at 8⅛d. to 8⅜d. per gallon in the North, while in the South the price is from 9¼d. to 9½d. per gallon.
CRESYLIC ACID is somewhat inactive, and the pale quality 97/99% is worth from 1s. 10d. to 2s. per gallon, while the dark quality 95/97% is quoted at about 1s. 7d. to 1s. 8d. per gallon on rails.
SOLVENT NAPHTHA has a moderate inquiry for export, but this has not had the effect of materially increasing the price, which remains at about 1s. per gallon on rails.
HEAVY NAPHTHA is quiet, and is worth about 1s. 1d. to 1s. 2d. per gallon on rails.
NAPHTHALENES are unchanged, the value of the low quality being from £6 10s. to £7 per ton, 74/76 quality £7 10s. to £8 per ton, and 76/78 from £8 10s. to £9 per ton on rails.
PITCH has further hardened, and there is a good demand, both for prompt and forward shipment. To-day's values are : 137s. 6d. to 142s. 6d., f.o.b. London ; 135s. to 140s., f.o.b. East Coast ; 135s. to 137s. 6d., f.o.b. West Coast.

Sulphate of Ammonia

There are no new features to report.

[*Current Market Prices on following pages.*]

A Defence of White Lead

AT the opening of the Decorators' Exhibition at Holland Park Hall, London, on Wednesday, Lord Askwith, in drawing attention to a beautiful stand designed by Sir Edwin Lutyens for the British white lead makers, in order to demonstrate the traditional merits of white lead, said that there was a proposal before Parliament for following out certain draft conventions arrived at by the International Labour Conference at Geneva. In their extreme form the conventions would, if suddenly applied, tend to stop a large section of that industry ; but science had come to the rescue. Danger to the workers arose from the dust thrown off when "rubbing down" ; this, it was claimed, could be obviated by "damp rubbing down," and scientific men had tried to invent a substance that would enable this to be done. It was hoped that the Government would confine itself to regulations only, and would not take the drastic step of suddenly stopping an industry, or interfering with the development of a trade, upon which science was at the moment working.

Mr. J. A. Gibson, the secretary of the Operative Painters' Society, remarked later that, in spite of what had been said, white lead was a very dangerous material, but, while the Geneva conventions intended that it should be suppressed, there was no suggestion that the supply of white lead should be suddenly cut off. There was to be a period of time allowed. White lead had its qualities, but if they could save human life at all it was their bounden duty to exert their powers to that end.

A Japanese Scientific Journal

A NEW periodical has been started in Japan, at Kobe, dealing with scientific and technical subjects, under the auspices of several German associations in Japan. There are editorial committees in Germany and Japan, consisting of professors and Doctors of Science. The publication, which is to appear monthly, is printed in German, and is entitled the *Japanisch-Deutsche Zeitschrift für Wissenschaft und Technik.*

Current Market Prices

General Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride, 90–95%	lb.	0	1	4	to	0	1	5
Acetone oil	ton	80	0	0	to	85	0	0
Acetone, pure	ton	127	10	0	to	130	0	0
Acid, Acetic, glacial, 99–100%	ton	73	0	0	to	74	0	0
Acetic, 80% pure	ton	49	0	0	to	50	0	0
Acetic, 40% pure	ton	25	0	0	to	26	0	0
Arsenic, liquid, 2000 s.g.	ton	85	0	0	to	88	0	0
Boric, commercial	ton	48	0	0	to	52	0	0
Carbolic, cryst. 39–40%	lb.	0	1	1½	to	0	1	2½
Citric	lb.	0	1	5	to	0	1	5½
Formic, 80%	ton	50	0	0	to	51	0	0
Hydrofluoric	lb.	0	0	7½	to	0	0	8½
Lactic, 50 vol.	ton	39	0	0	to	40	0	0
Lactic, 60 vol.	ton	44	0	0	to	46	0	0
Nitric, 80 Tw.	ton	26	0	0	to	27	0	0
Oxalic	lb.	0	0	6½	to	0	0	6½
Phosphoric, 1.5	ton	35	0	0	to	38	0	0
Pyrogallic, cryst.	lb.	0	5	9	to	0	6	0
Salicylic, technical	lb.	0	1	9	to	0	2	0
Sulphuric, 92–93%	ton	6	0	0	to	7	0	0
Tannic, commercial	lb.	0	2	3	to	0	2	9
Tartaric	lb.	0	1	1½	to	0	1	2
Alum, lump	ton	12	10	0	to	13	0	0
Chrome	ton	28	0	0	to	29	0	0
Alumino ferric	ton	7	0	0	to	7	5	0
Aluminium, sulphate, 14–15%	ton	8	10	0	to	9	0	0
Sulphate, 17–18%	ton	10	10	0	to	11	0	0
Ammonia, anhydrous	lb.	0	1	6	to	0	1	8
.880	ton	32	0	0	to	34	0	0
.920	ton	22	0	0	to	24	0	0
Carbonate	ton	30	0	0	to	32	0	0
Chloride	ton	50	0	0	to	55	0	0
Muriate (galvanisers)	ton	35	0	0	to	37	10	0
Nitrate (pure)	ton	35	0	0	to	40	0	0
Phosphate	ton	63	0	0	to	65	0	0
Sulphocyanide, commercial 90%	lb.	0	1	1	to	0	1	3
Amyl acetate, technical	ton	280	0	0	to	300	0	0
Arsenic, white powdered	ton	65	0	0	to	68	0	0
Barium, carbonate, Witherite	ton	5	0	0	to	6	0	0
Carbonate, Precip.	ton	15	0	0	to	16	0	0
Chlorate	ton	65	0	0	to	70	0	0
Chloride	ton	15	10	0	to	16	0	0
Nitrate	ton	33	0	0	to	35	0	0
Sulphate, blanc fixe, dry	ton	20	10	0	to	21	0	0
Sulphate, blanc fixe, pulp	ton	10	5	0	to	10	10	0
Sulphocyanide, 95%	lb.	0	0	11	to	0	1	0
Bleaching powder, 35–37%	ton	10	7	6	to	10	17	6
Borax crystals, commercial	ton	25	0	0	to		—	
Calcium acetate, Brown	ton	13	0	0	to	14	0	0
Grey	ton	22	0	0	to	23	0	0
Carbide	ton	13	0	0	to	13	10	0
Chloride	ton	5	15	0	to	6	0	0
Carbon bisulphide	ton	35	0	0	to	40	0	0
Casein technical	ton	80	0	0	to	90	0	0
Cerium oxalate	lb.	0	3	0	to	0	3	6
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	6	0	to	0	6	6
Oxide, black	lb.	0	9	6	to	0	10	0
Copper chloride	lb.	0	1	1	to	0	1	2
Sulphate	ton	25	10	0	to	26	0	0
Cream Tartar, 98–100%	ton	86	0	0	to	88	0	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde, 40% vol.	ton	70	0	0	to	72	0	0
Formusol (Rongalite)	lb.	0	2	1	to	0	2	2
Glauber salts, commercial	ton	4	0	0	to	4	10	0
Glycerin crude	ton	65	0	0	to	67	10	0
Hydrogen peroxide, 12 vols.	gal	0	2	0	to	0	2	1
Iron perchloride	ton	18	0	0	to	20	0	0
Sulphate (Copperas)	ton	3	10	0	to	4	0	0
Lead acetate, white	ton	41	0	0	to	42	0	0
Carbonate (White Lead)	ton	43	0	0	to	45	0	0
Nitrate	ton	44	10	0	to	45	0	0
Litharge	ton	37	0	0	to	39	0	0
Lithophone, 30%	ton	22	10	0	to	23	0	0
Magnesium chloride	ton	3	10	0	to	3	15	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	5	15	0	to	6	0	0
Sulphate (Druggists')	ton	8	0	0	to	9	0	0
Manganese Borate, commercial	ton	65	0	0	to	75	0	0
Sulphate	ton	45	0	0	to	50	0	0
Methyl acetone	ton	82	0	0	to	85	0	0
Alcohol, 1% acetone	ton	105	0	0	to	110	0	0
Nickel sulphate, single salt	ton	37	0	0	to	38	0	0
Ammonium sulphate, double salt	ton	37	0	0	to	38	0	0
Potash, Caustic	ton	30	0	0	to	32	0	0
Potassium bichromate	lb.	0	0	5½	to	0	0	6
Carbonate, 90%	ton	30	0	0	to	31	0	0
Chloride, 80%	ton	9	0	0	to	10	0	0
Chlorate	lb.	0	0	3½	to		—	
Metabisulphite, 50–52%	ton	65	0	0	to	70	0	0
Nitrate, refined	ton	38	0	0	to	40	0	0
Permanganate	lb.	0	0	10	to	0	0	10½
Prussiate, red	lb.	0	2	10	to	0	3	0
Prussiate, yellow	lb.	0	0	11	to	0	1	0
Sulphate, 90%	ton	10	0	0	to	10	10	0
Salammoniac, firsts	cwt.	3	3	0	to		—	
Seconds	cwt.	3	0	0	to		—	
Sodium acetate	ton	25	0	0	to	25	10	0
Arsenate, 45%	ton	45	0	0	to	48	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	4½	to	0	0	4½
Bisulphite, 60–62%	ton	21	0	0	to	23	0	0
Chlorate	lb.	0	0	3	to	0	0	3½
Caustic, 70%	ton	17	10	0	to	18	0	0
Caustic, 76%	ton	18	10	0	to	19	0	0
Hydrosulphite, powder	lb.	0	1	5	to	0	1	6
Hyposulphite, commercial	ton	10	10	0	to	11	0	0
Nitrite, 96–98%	ton	27	10	0	to	28	0	0
Phosphate, crystal	ton	16	0	0	to	16	10	0
Perborate	lb.	0	0	11	to	0	1	0
Prussiate	lb.	0	0	6	to	0	0	6½
Sulphide, crystals	ton	8	10	0	to	9	0	0
Sulphide, solid, 60–62 %	ton	14	10	0	to	15	10	0
Sulphite, cryst.	ton	11	10	0	to	12	0	0
Strontium carbonate	ton	50	0	0	to	55	0	0
Nitrate	ton	50	0	0	to	55	0	0
Sulphate, white	ton	6	10	0	to	7	10	0
Sulphur chloride	ton	25	0	0	to	27	10	0
Flowers	ton	11	0	0	to	11	10	0
Roll	ton	9	15	0	to	10	10	0
Tartar emetic	lb.	0	0	11½	to	0	1	0
Tin perchloride, 33%	lb.	0	1	1	to	0	1	2
Perchloride, solid	lb.	0	1	3	to	0	1	4
Protochloride (tin crystals)	lb.	0	1	4	to	0	1	5
Zinc chloride 102° Tw.	ton	20	0	0	to	21	0	0
Chloride, solid, 96–98%	ton	25	0	0	to	30	0	0
Oxide, 99%	ton	42	0	0	to	45	0	0
Dust, 90%	ton	50	0	0	to	55	0	0
Sulphate	ton	15	0	0	to	16	0	0

Pharmaceutical Chemicals

Acetyl salicylic acid	lb.	0	3	4	to	0	3	8
Acetanilid	lb.	0	1	9	to	0	2	0
Acid, Gallic, pure	lb.	0	3	0	to	0	3	3
Lactic, 1.21	lb.	0	2	6	to	0	2	9
Salicylic, B.P.	lb.	0	2	2	to	0	2	4
Tannic, leviss	lb.	0	3	2	to	0	2	4
Amidol	lb.	0	7	9	to	0	8	3
Amidopyrin	lb.	0	13	0	to	0	13	6
Ammon ichthosulphonate	lb	0	1	10	to	0	2	0
Barbitone	lb.	0	16	6	to	0	17	[illegible]
Beta naphthol resublimed	lb.	0	2	0	to	0	2	[illegible]
Bromide of ammonia	lb.	0	0	7	to	0	0	7
Potash	lb.	0	0	6	to	0	0	6
Soda	lb.	0	0	7	to	0	0	7½
Caffeine, pure	lb.	0	10	9	to	0	11	0½
Calcium glycerophosphate	lb.	0	5	9	to	0	6	0½
Lactate	lb.	0	1	9	to	0	2	0
Calomel	lb.	0	3	9	to	0	4	0
Chloral hydrate	lb.	0	4	0	to	0	4	3
Cocaine alkaloid	oz.	0	19	6	to	1	0	0
Hydrochloride	oz.	0	16	9	to	0	17	3
Corrosive sublimate	lb.	0	3	3	to	0	3	6
Eucalyptus oil, B.P. (70–75% eucalyptol)	lb.	0	2	8	to	0	2	10
B.P. (75–80% eucalyptol)	lb.	0	2	9	to	0	2	11
Guaiacol carbonate	lb.	0	11	0	to	0	11	6
Liquid	lb.	0	8	9	to	0	9	3
Pure crystals	lb.	0	9	3	to	0	9	9
Hexamine	lb.	0	4	0	to	0	4	3
Hydroquinone	lb.	0	3	6	to	0	4	0
Lanoline anhydrous	lb.	0	0	7	to	0	0	7½
Lecithin ex ovo	lb.	0	17	6	to	0	19	0
Lithi carbonate	lb.	0	9	6	to	0	10	0
Methyl salicylate	lb.	0	2	8	to	0	3	2
Metol	lb.	0	9	0	to	0	10	0
Milk sugar	cwt.	4	2	6	to	4	10	0
Paraldehyde	lb.	0	1	5	to	0	1	6
Phenacetin	lb.	0	6	3	to	0	6	9
Phenazone	lb.	0	8	3	to	0	8	6
Phenolphthalein	lb.	0	6	9	to	0	7	0
Potassium sulpho guaiacolate	lb.	0	5	0	to	0	5	3
Quinine sulphate, B.P.	oz.	0	2	3	to		—	

	Per	£	s.	d.		£	s.	d.
Resorcin, medicinal	lb.	0	5	6	to	0	5	9
Salicylate of soda powder	lb.	0	2	6	to	0	2	9
Crystals	lb.	0	2	9	to	0	3	0
Salol	lb.	0	3	3	to	0	3	9
Soda Benzoate	lb.	0	2	6	to	0	2	9
Sulphonal	lb.	0	14	0	to	0	14	6
Terpene hydrate	lb.	0	1	9	to	0	2	0
Theobromine, pure	lb.	0	11	0	to	0	11	6
Soda salicylate	lb.	0	8	6	to	0	9	0
Vanillin	lb.	1	3	0	to	1	4	0

Coal Tar Intermediates, &c.

Alphanaphthol, crude	lb.	0	2	0	to	0	2	3
Refined	lb.	0	2	6	to	0	2	9
Alphanaphthylamine	lb.	0	1	6½	to	0	1	7
Aniline oil, drums extra	lb.	0	0	9	to	0	0	9½
Salts	lb.	0	0	9½	to	0	0	10
Anthracene, 40–50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine)	lb.	0	2	6	to	0	2	9
Benzidine, base	lb.	0	4	9	to	0	5	0
Sulphate	lb.	0	3	9	to	0	4	0
Benzoic acid	lb.	0	2	0	to	0	2	3
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol	lb.	0	1	1	to	0	1	2
Betanaphthylamine, technical	lb.	0	4	0	to	0	4	3
Crocein Acid, 100% basis	lb.	0	3	3	to	0	3	6
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	4	6	to	0	4	9
Dinitrobenzol	lb.	0	1	1	to	0	1	2
Dinitrochlorbenzol	lb.	0	0	11	to	0	1	0
Dinitronaphthalene	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	4	to	0	1	5
Dinitrophenol	lb.	0	1	6	to	0	1	7
Dimethylaniline	lb.	0	2	9	to	0	3	0
Diphenylamine	lb.	0	3	6	to	0	3	9
H-Acid	lb.	0	4	9	to	0	5	0
Metaphenylenediamine	lb.	0	4	0	to	0	4	3
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	5	9	to	0	6	0
Metatoluylenediamine	lb.	0	4	0	to	0	4	3
Monosulphonic Acid (2.7)	lb.	0	8	6	to	0	9	6
Naphthionic acid, crude	lb.	0	2	6	to	0	2	8
Naphthionate of Soda	lb.	0	2	6	to	0	2	8
Naphthylamin-di-sulphonic-acid	lb.	0	4	0	to	0	4	3
Nevile Winther Acid	lb.	0	7	3	to	0	7	9
Nitrobenzol	lb.	0	0	7	to	0	0	8
Nitronaphthalene	lb.	0	0	11½	to	0	1	0
Nitrotoluol	lb.	0	0	8	to	0	0	9
Orthoamidophenol base	lb.	0	12	0	to	0	12	6
Orthodichlorbenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	0	10	to	0	0	11
Orthonitrotoluol	lb.	0	0	3	to	0	0	4
Para-amidophenol, base	lb.	0	8	6	to	0	9	0
Hydrochlor	lb.	0	7	6	to	0	8	0
Paradichlorbenzol	lb.	0	0	9	to	0	0	10
Paranitraniline	lb.	0	2	7	to	0	2	9
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	2	9	to	0	3	0
Paraphenylenediamine, distilled	lb.	0	12	0	to	0	12	6
Paratoluidine	lb.	0	5	6	to	0	5	9
Phthalic anhydride	lb.	0	2	6	to	0	2	9
Resorcin, technical	lb.	0	4	0	to	0	4	3
Sulphanilic acid, crude	lb.	0	0	10	to	0	0	11
Tolidine, base	lb.	0	7	3	to	0	7	9
Mixture	lb.	0	2	6	to	0	2	9

Essential Oils and Synthetics

Essential Oils.		£	s.	d.
Anise	c.i.f. 1/9 spot	0	1	10
Bay		0	12	0
Bergamot		0	13	0
Cajaput		0	3	0
Camphor, white	per cwt.	4	0	0
Brown	„	3	15	0
Cassia	c.i.f. 10/6 spot	0	10	9
Cedarwood		0	1	4½
Citronella (Ceylon)	nominal, and very scarce c.i.f. 3/6 spot	0	4	0
(Java)	c.i.f. 4/0 spot	0	4	2
Clove		0	8	0
Eucalyptus	firm	0	2	6
Geranium Bourbon	firm	1	14	0
Lavender	firm	1	2	0
Lavender spike		0	2	9
Lemon		0	2	11
Lemongrass	per oz.	0	0	2½
Lime (distilled)		0	4	0
Orange sweet (Sicilian)		0	11	0
(West Indian)		0	9	0
Palmarosa		1	3	0
Peppermint (American)	easier	0	15	0
Mint (dementholised Japanese)		0	12	0
Patchouli		1	10	0
Otto of Rose	per oz.	1	15	0
Rosemary		0	1	7
Sandalwood		1	6	0
Sassafras	dearer	0	7	0
Thyme	2/6 to	0	8	0

Synthetics.		£	s.	d.
Benzyl acetate	per lb.	0	3	0
Benzoate	„	0	3	0
Citral	„	0	10	0
Coumarine	„	0	18	6
Heliotropine	„	0	8	0
Ionone	„	1	5	0
Linalyl acetate	„	1	2	6
Methyl salicylate	firmer	0	2	9
Musk xylol		0	11	0
Terpeniol		0	3	0

Steamed Coke in Blast Furnaces

RECENT studies at the Pittsburgh experiment station of the United States Bureau of Mines, Department of the Interior, have revealed some interesting facts as to the probable behaviour of steamed coke in the blast furnace. The literature on the chemistry of the blast furnace was thoroughly reviewed, and with this information in mind, the probable behaviour of the coke sulphur in the blast furnace was deduced. Enough small-scale tests were conducted to furnish a check on most of the important deductions, and the conclusions derived therefrom accord with what is already known in regard to the forms of sulphur in coke, and fit in well with the general opinion concerning blast-furnace reactions. The results of this study suggest two possible methods for correcting the coke sulphur trouble in the blast furnace: first, this surface sulphur could be removed by some such process as steaming, or hydrogenation; or, secondly, it could be prevented from entering the spongy iron at this zone by dipping the coke in some material which would absorb the sulphur more readily than would the iron. Possibly lime could be used in this case; but whatever the nature of the substance it should be such that it will not interfere with the proper combustion of the coke at the combustion zone. Further studies along this line would no doubt lead to some interesting discoveries as to the behaviour of the sulphur in the blast furnace. The results of this study, made in co-operation with the Carnegie Institute of Technology, are given in Serial 2,518, "Forms of sulphur in steamed coke and their action in the blast furnace," by John H. Thompson, which may be obtained from the Department of the Interior, Bureau of Mines, Washington, D.C.

The Utilisation of Slack Coal

PROFESSOR K. N. Moss, the professor of Mining at Birmingham University, who addressed the members of the Rotary Club at their weekly luncheon in Birmingham on Monday, referred to the commercial potentialities of slack, and indicated the progress which is being made in the conversion of coal dust into liquid fuel. The great difficulty, he said, was to find a solvent, but a Japanese scientist, Mr. Kisagi, claimed to have achieved great success with hydro-naphthalene, by which 70 per cent. of the coal substance could be dissolved and used as a fuel oil. Other solvents were being experimented with, and there was little doubt that the next 10 years would bring to light many important discoveries in this field of research—discoveries which would give to the coal industry the power of surmounting many of the difficulties which assailed it. Valuable work in the hydrogenation of coal for the manufacture of fuel oil was being carried out in the Mining Department of Birmingham University by Mr. H. G. Shatwell, but it was too early as yet to say whether the process would prove a commercial success. Twenty-five years ago little or no slack was sent out of the mines, but in years to come we should have to face a small coal rather than a lump coal output. In many ways this would be for the good of the nation, because the use of raw coal as fuel was both extravagant and bad for the atmosphere. The change, however, would not be made until a very much larger chemical industry had been developed to make the maximum use of what would otherwise be waste products of carbonisation.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, October 18, 1923.

DURING the past week business in the heavy chemical market has shown some slight improvement, inquiries both for home and export being more numerous.

Prices on the whole are steady, and there is no change of importance to note.

Industrial Chemicals

ACID, ACETIC, GLACIAL, 98/100%.—Numerous inquiries and spot material inclined to be scarce. Quoted £60 to £65 per ton in casks; 80% pure, £51 to £53 per ton; 80% technical, £47 to £49 per ton, c.i.f. U.K. ports, duty free.

ACID BORACIC.—Crystals or granulated, £48 per ton; powdered, £50 per ton, carriage paid U.K. stations, minimum ton lots.

ACID CARBOLIC (ICE CRYSTALS).—Unchanged at about 1s. 2d. per lb., f.o.b. U.K. port.

ACID CITRIC.—Very little inquiry. Price about 1s. 5d. per lb., less 5%.

ACID FORMIC 85%.—Moderate inquiry. Price about £49 per ton, ex store, spot delivery.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC 80°.—£23 10s. per ton, ex station, full truck loads.

ACID OXALIC.—Now quoted at 5¾d. per lb., ex store. Very little inquiry.

ACID SULPHURIC.—144°, £3 15s. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC.—B.P. crystals. Unchanged at about 1s. 1d. per lb., less 5% ex store, spot delivery. Offered for early delivery at 1s. ½d. per lb., less 5% c.i.f. U.K. ports.

ALUMINA SULPHATE.—17/18% iron free quality offered from Continent at £10 7s. 6d. per ton, c.i.f. U.K. port.

ALUM, CHROME.—Quoted £24 to £27 per ton, according to quality.

ALUM, POTASH (LUMP).—Moderate export inquiry. Price for English material about £10 17s. 6d. per ton, f.o.b. U.K. port. Continental material offered at about £9 12s. 6d. per ton, c.i.f. U.K. port.

AMMONIA ANHYDROUS.—Quoted 1s. 5½d. per lb., ex station. Offered for export at 1s. 4½d. per lb., f.o.b. U.K. port.

AMMONIA LIQUID 880°.—Now quoted 3d. per lb., delivered, containers extra.

AMMONIA MURIATE.—Grey galvanizers quality. Unchanged at £31 to £32 per ton. Fine white crystals offered at £23 15s. per ton, c.i.f. U.K. ports. Spot lots about £26 per ton, ex store.

AMMONIA SULPHATE.—25¼% material, £12 19s. 6d. per ton; 25¾% neutral quality, £14 2s. 6d. per ton ex works, October delivery.

ARSENIC, WHITE POWDERED.—Spot material now offered at about £65 per ton, ex store. Quotations for forward delivery inclined to be a little higher than a week ago.

BARIUM CHLORIDE 98/100%.—Moderate inquiry. Quoted £14 5s. per ton, ex store, spot delivery.

BARYTES.—Finest white English unchanged at £5 5s. per ton, ex works. Good quality Continental material offered at £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Spot lots £11 5s. per ton, ex station. Contracts 20s. per ton less.

BORAX.—Granulated, £24 10s. per ton; crystal, £25 per ton; powdered, £26 per ton, carriage paid U.K. stations. Minimum ton lots.

CALCIUM CHLORIDE.—English material, £5 12s. 6d. per ton, ex station. Offered for export at about £4 10s. per ton, f.o.b. U.K. port.

COPPERAS, GREEN.—Good export inquiry. Price about £2 2s. 6d. per ton, f.o.b. U.K. port.

COPPER SULPHATE.—Unchanged at about £25 12s. 6d. per ton, less 5 per cent. delivered, f.o.b. U.K. port.

FORMALDEHYDE 40%.—Spot lots now offered at about £64 to £65 per ton, ex store.

GLAUBER SALTS.—Fine white crystals unchanged at about £3 5s. per ton, ex quay.

LEAD, RED.—English material quoted £40 per ton carriage paid U.K. stations. Continental now offered at about £36 per ton, ex store, spot delivery.

LEAD, WHITE.—Offered from the Continent at about £37 5s. per ton, c.i.f. U.K. port.

LEAD, ACETATE.—White crystals now quoted £42 per ton, ex wharf, spot delivery. Offered for early delivery at £39 5s. per ton, ex wharf.

MAGNESITE, CALCINED.—Finest English ground quoted £8 per ton, ex station. Offered from the Continent at about £7 5s. per ton, c.i.f. U.K. ports.

MAGNESIUM CHLORIDE.—Quoted £2 10s. per ton, c.i.f. U.K. ports, prompt shipment. Spot lots offered at about £3 2s. 6d. per ton, ex store.

MAGNESIUM SULPHATE (Epsom Salts).—Commercial quality offered at about £5 per ton, ex store. B.P. quality, £6 5s. per ton, ex station, prompt delivery.

POTASH CAUSTIC 88/92%.—Continental quotations inclined to be higher at about £29 10s. per ton c.i.f. U.K. ports. Spot lots quoted £32 per ton, ex store.

POTASSIUM BICHROMATE.—Unchanged at 5¾d. per lb., delivered.

POTASSIUM CARBONATE 96/98%.—Offered from the Continent at £24 10s. per ton, c.i.f. U.K. ports. Spot lots offered £28 17s. 6d. per ton, ex store.

POTASSIUM CHLORATE.—Unchanged at about 3d. per lb.

POTASSIUM NITRATE (Saltpetre).—Offered from the Continent at about £26 per ton, c.i.f. U.K. ports. Spot lots on offer at about £30 per ton.

POTASSIUM PERMANGANATE.—B.P. crystals. Spot material quoted 9¾d. per lb., ex store.

POTASSIUM PRUSSIATE (Yellow).—Now quoted at about 1s. 0½d. per lb., ex store, spot delivery.

SODA, CAUSTIC.—76/77%, £19 7s. 6d. per ton; 70/72%, £17 17s. 6d. per ton; 60/62% broken, £19 2s. 6d. per ton; 98/99% powdered, £22 15s. per ton. All ex-station, spot delivery. Contracts, 20s. per ton less.

SODIUM ACETATE.—Price remains unchanged at about £24 15s. per ton, ex store.

SODIUM BICARBONATE.—Refined re-crystallised quality, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

SODIUM CARBONATE.—Soda crystals, £5 to £5 5s. per ton, ex quay or station. Alkali 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large commercial crystals offered from the Continent at about £9 per ton, c.i.f. U.K. ports. Spot lots quoted £10 per ton, ex store. Pea crystals about £14 5s. per ton, ex store.

SODIUM NITRATE.—Refined 96/98% quality quoted £13 5s. per ton, f.o.r. or f.o.b. U.K. port.

SODIUM NITRITE 100%.—In little demand. Price £26 10s. to £28 10s. per ton according to quantity, f.o.b. U.K. port.

SODIUM PRUSSIATE (Yellow).—Very little inquiry. Unchanged at about 6d. per lb., ex store.

SODIUM SULPHATE (Saltcake).—£4 per ton, ex station for home consumption. Good export inquiry.

SODIUM SULPHIDE.—60/65% Solid, £14 per ton, ex station. Broken, £1 per ton more. 31/34% crystals, £8 15s. per ton, ex station.

SULPHUR.—Flowers, £10 per ton; roll, £9 per ton; rock, £9 per ton; ground, £8 per ton. Prices nominal.

TIN (Crystals).—Unchanged at 1s. 4d. per lb.

ZINC CHLORIDE.—98/100% solid quoted about £26 per ton, f.o.b. U.K. port.

ZINC SULPHATE.—Offered from the Continent at about £11 5s. per ton, c.i.f. U.K. ports. Spot lots quoted £14 10s. per ton, ex store.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ACETANILIDE.—Supplies are offered at 1s. 8d. per lb., delivered.

ALPHA NAPTHYLAMINE.—Large export inquiry. Price 1s. 6d. per lb., f.o.b.

BETA NAPTHOL.—Several inquiries. Price 1s. 1d. per lb., delivered.

BENZIDINE BASE.—Export inquiry. Price 4s. 9d. per lb., 100% basis.

BENZOIC ACID.—Home inquiry. Price quoted 1s. 10d. per lb., delivered.

DIPHENYLAMINE.—Some demand, home and export. Price 3s. 3d. per lb.

DIMETHYLANILINE.—Some home demand. Price 2s. 8d. per lb., delivered, returnable drums.

J ACID.—Small home demand. Price 13s. per lb., 100% basis, carriage paid.

META PHENYLENE DIAMINE.—Home inquiry. Price 4s. 2d. per lb., delivered.

PARANITRANILINE.—Some good export inquiries. Price quoted, 2s. 7d. per lb., f.o.b.

PARA PHENYLENE DIAMINE.—Export inquiry. Price 12s. 6d. per lb., 100% basis.

PARA TOLUIDINE.—Inquiries for home and export. Price 4s. 6d. per lb.

R SALT.—Some home inquiry. Price 2s. 9d. per lb., 100% basis, carriage paid.

The French Dye Fusion

WITH respect to the fusion of the Compagnie Nationale des Matières Colorantes et Produits Chimiques with the Manufactures de Produits Chimiques du Nord, better known as Etablissements Kuhlmann, a French correspondent of the *Manchester Guardian Commercial* states that what connection this move has with the existing French occupation of the aniline and other chemical works in Germany cannot be stated definitely, but that there is a connection would seem beyond doubt. The combination of these two powerful concerns follows the methods adopted by the Germans themselves in their vertical trust organisations, for the Kuhlmann works are occupied in the manufacture of mineral acids which form the basis of the intermediate products serving the dye industry, and they also produce certain of these intermediate products. On the other hand, the Compagnie Nationale des Matières Colorantes, established in 1917, represents France's effort to rid herself of dependence on the German dye industry, with the State's direct assistance. It is responsible for 65 per cent. of the entire French output of dyestuffs, and therefore also mainly for the fact that this country is now meeting 85 per cent. of its own requirements in this line. The new combination will have a capital of 150,000,000 francs, Kuhlmann issuing 50,000,000 in new shares of a nominal value of 250 francs, which will be exchanged against those of the dye company. The latter will certainly gain financially, for at the end of last year its reserves amounted to only about 12,000,000 francs and working capital to 46,000,000 francs, while Kuhlmann's corresponding figures were 67,000,000 and over 100,000,000 francs. Moreover, Kuhlmann was able to pay a dividend of 8 per cent. on last year's operations, while the Compagnie Nationale paid nothing. Kuhlmann 250-franc shares are quoted at about 700 francs and Compagnie Nationale's 500-franc shares at about the same figure.

The Piece Dyers' Proposal

THE Shipping Merchants' Committee of the Manchester Chamber of Commerce sat in Manchester, on Monday, to consider the present position with regard to the piece dyers' terms. It was reported that a large number of signatures have already been appended to the resolution which states that no individual agreement with the Piece Dyers' Association will be made. It is stated that trade is leaving this country as a result of the terms which the dyers are endeavouring to force on the trade. Steps are being taken to induce the dyers to withdraw the proposal which demands that all business must be placed with members of their association, and every endeavour will be made by the Manchester merchants to oppose the dyers' action. Many contracts are in abeyance until this dispute is settled, and the delay is causing increased unemployment.

The Manchester Chemical Market

(FROM OUR OWN CORRESPONDENT.)

Manchester, October 18, 1923.

A SLIGHT though perceptible improvement in the undertone of the market continues to be reported; the total volume of business, however, is still relatively small judged by normal standards. Home consumption keeps on quietly steady lines, with a fair amount of business being done on foreign account, restricted as before very largely to the bread-and-butter articles and for the Dominion markets. There have been one or two instances of easier prices during the past few days, but they are not important, values generally keeping up very well.

Heavy Chemicals

Caustic soda is still a moderately active section, both on home consumption and foreign account, and values are steady at £16 17s. 6d. for 60 per cent. material up to £19 7s. 6d. for 76–77 per cent. Bleaching powder also is in quietly steady demand for both branches of trade, with prices to home users unchanged at £11 5s. per ton. Saltcake is firm at £4 10s., with supplies still being taken up for export. Prussiate of soda is dull at 5¾d. per lb. Hyposulphite of soda is quiet but steady, at £14 10s. to £15 for photographic crystals and £9 10s. per ton for commercial. Glauber salts attract little attention and prices are fractionally weaker at £3 15s. to £4 per ton. Phosphate of soda is also inactive and easier at £14 10s. per ton. Acetate of soda is steady and in fair demand at £24 per ton. Chlorate of soda keeps firm and moderately active at 2¾d. per lb. Not much business is being done in sulphide of sodium; 60-65 per cent, concentrated is quoted at £14 to £14 10s. per ton and crystals at £9. Bicarbonate of soda is firm and in quietly steady demand at £10 10s. per ton. Nitrite of soda is more active but unchanged at £26 10s. per ton. Soda crystals are quiet but steady at £5 5s. per ton delivered. Bichromate of soda is being taken up in moderate quantities and prices are maintained at 4½d. per lb. Alkali continues firm on the basis of £7 10s. per ton for 58 per cent. material; both home and export inquiry for this product keeps up.

Caustic and carbonate of potash prices are easier, though the demand for both is still fairly good; 88–90 per cent. caustic is now quoted at round £29 per ton, with 90 per cent. carbonate offering at £26 and 96 per cent. at £29 per ton. Chlorate of potash is quiet but steady at 3d. per lb. Permanganate is on offer at 9d. to 9½d. per lb., without, however, arousing much buying interest. Bichromate of potash is firm and in fair demand at 5¾d. per lb. Yellow prussiate of potash is now quoted at round 1s. per lb., the demand still being slow.

Arsenic, white powdered, Cornish makes, is still quoted at £67 to £68 per ton, Manchester, with the demand for shipment rather better than it has been for some time; foreign arsenic is on the market at a much lower figure. Sulphate of copper keeps quiet at £25 10s. to £26 per ton, f.o.b. Commercial Epsom salts are unchanged from last week at £4 to £4 10s. and magnesium sulphate, B.P., at £6 per ton, a fair amount of business being put there. Acetates are very firm, owing to scarcity coupled with a quietly steady demand. White acetate of lead is quoted at £41 and brown at up to £45. Grey acetate of lime is on offer at £22 and brown at £12 10s. per ton. Nitrate of lead is in quiet demand at £42 per ton.

Acids and Tar Products

Tartaric and citric acids are both dull sections, little buying interest being shown; the former is quoted round 1s. 2d. and citric at about 1s. 5½d. per lb. Acetic acid keeps steady at £46 10s. to £47 per ton for 80 per cent. technical and £65 per ton for glacial, a fair amount going into consumption. Oxalic acid continues quiet at 5¾d. per lb.

There appears to have been a general improvement in the coal-tar products section. Pitch is in quietly steady demand, and rather firmer at £6 10s. per ton, Manchester. Creosote oil is steady at 8½d. per gallon, with a moderate inquiry for shipment. Solvent naphtha is firm at 1s. 3d. to 1s. 3½d. per gallon, a rather more active demand being reported. Naphthalenes are quiet but steady at £19 to £20 for refined and from £6 per ton for crude. Carbolic acid is scarce and offers are very firmly maintained at 3s. 8d. per gallon for crude and 1s. 2½d. per lb. for crystals.

Company News

ROSARIO NITRATE CO.—An interim dividend has been declared at the rate of 5 per cent. The total distribution for the previous year was 10 per cent.

BRITISH PORTLAND CEMENT MANUFACTURERS.—The directors announce an interim dividend on the ordinary shares of 5 per cent. actual, the same as a year ago.

MIAMI COPPER CO.—A dividend of 50 cents per share on the capital stock for the last quarter is announced, payable on November 15. Last year the dividend was the same.

BORAX CONSOLIDATED, LTD.—A dividend has been declared at the rate of 6 per cent. per annum, less tax, on the preferred ordinary shares in respect of the half-year to September 30 last. The transfer books will be closed from October 19 to October 31, both days inclusive.

BRITISH CELLULOSE & CHEMICAL MANUFACTURING CO., LTD.—At a meeting held on Friday, October 12, a special resolution passed at the extraordinary meeting of shareholders on September 27 changing the name of the company to British Celanese Ltd., was confirmed.

BURMAH OIL CO., LTD.—The directors announce an interim dividend of 2s. per share, free of tax, on the ordinary shares on account of the current year, payable on November 7, to holders on the register October 10. At the corresponding period last year the interim payment was the same.

ALIANZA CO.—In addition to the interim dividend of 20 per cent. on account of profits for the current year (announced in our issue of October 13), a bonus of 60 per cent. out of surplus funds has been declared, and warrants, less tax, will be posted on November 8. An interim dividend of 20 per cent. was paid for 1923, but no bonus was declared.

SADLER AND CO.—The profit for the year to June 30 last, after charging income tax, interest on prepaid shares, etc., and providing for corporation profits tax, amounts to £25,002, to which is added £6,592 brought in, making a total of £31,594. The directors recommend a further dividend of 4 per cent., less tax, making 7 per cent. for the year. A sum of £15,000 is deducted for depreciation, leaving £7,551 to be carried forward. The annual meeting will be held at Middlesbrough on October 22, at 2 p.m.

Tariff Changes

GERMANY :—Nitrate of ammonia (ammonia saltpetre), not in shells or capsules, has been deleted from the list of articles given last week as still liable to export duty. It may, therefore, now be exported from Germany without export licence.

GREECE :—Special regulations have recently been issued governing the import, sale and packing of quinine.

MEXICO :—The importation of certain alkaloids and their salts is prohibited, including opium, cocaine, heroin, morphine.

PORTUGAL :—Synthetic nitrogenous manures produced in Portugal and goods destined for the maintenance of crews and passengers of Portuguese ships will be exempt from payment of surtax.

Industrial Uses of Mica

IN the present electrical age mica supplies a need not filled by any other substance. Its non-conductivity of electricity and heat and its toughness, flexibility and elasticity make it invaluable in the electrical manufacturing industry. Before it was so employed it was probably used chiefly in glazing, for which large sheets of mica with perfect cleavage were required. Much mica that was then regarded as waste is now used in electrical and other industries by making it into " mica board," or built-up mica. Imperfect sheets of mica are also ground and used in the decoration of wall paper, in the manufacture of lubricants, in fancy paints, rubber goods, moulded mica, and roofing papers, for covering steam pipes, and in many other ways.

The only commercially valuable varieties of mica mined in the United States, according to the Department of the Interior, Geological Survey, are biotite and muscovite. Biotite is a dark mineral, and its sheets are less flexible and elastic than those of muscovite. Muscovite is transparent or light coloured when split into thin sheets. Mica mined for commercial use is commonly found in rough blocks, or " books," as they are called in the Western States.

German Industry in September

THE Commercial Secretary at Berlin (Mr. J. W. F. Thelwall) has forwarded to the Department of Overseas Trade the following review based on the reports of the Prussian Chambers of Commerce on trade and industry during September.

The devastating effect of the occupation and separation of the Rhineland and the Ruhr district may now be seen in all branches of German industry. The heavy fall of the mark as a result mainly thereof caused a great increase in the prices of all materials and in wages ; and as, owing to the too substantial and rapid currency depreciation, it was impossible for industry to obtain the requisite capital, the existing shortage of capital and credit in trade and industry was greatly accentuated in the month under review, particularly as the Reichsbank were compelled by circumstances to restrict the granting of credit still further. Partly for these reasons and also owing to the heavy burden of taxation, the world's market prices were reached or exceeded in more and more spheres of trade and industry. The consequences were increased stagnation in sales and further restrictions of work.

The reports of the Chambers of Commerce show that, although further large portions of trade and industry have gone over to the system of calculating prices in gold marks, no final solution of the difficulties presented by the currency depreciation has been arrived at so long as a stable currency has not been created enabling all branches of industry, including the retail trade, to fix prices on a stable basis and to ensure the countervalue for deliveries and services.

Potash.—In the potash industry there were fewer sales than in the previous month. Shifts had, in consequence, to be dropped, and the dismissal of workers could no longer be avoided. Potash prices were repeatedly increased, but in no way kept pace with the advance in prices of all materials, fuel, and explosives, and with the rise in wages and salaries. Agriculture held back with orders on account of lack of money. Only sulphate of potash products could be sold to a certain extent to foreign countries, frequently, however, only at a loss in consideration of the position of the world's market prices. A large part of the production had to be taken into stock.

Chemical Industry.—Foreign sales of chemical preparations have declined to an alarming extent. The existing stock of orders is considerably below that which is normally on hand, both as regards quantity and value. In the interests of the workers, restrictions of operations have, so far, not been introduced, though this will be difficult to avoid in the event of the continuance of present conditions.

Demand for Red Oxide Paint in Paste

H.M. SENIOR TRADE COMMISSIONER in South Africa reports that the South African Railway and Harbours are calling for tenders, to be presented by November 12, 1923, for the supply of red oxide paint in paste during the period January 1 to June 30, 1924. (Tender No. 484.) A complete set of documents comprising general conditions of stores contracts, tender form and specification may be inspected by British firms at the Department of Overseas Trade (Room 53), 35, Old Queen Street, London, S.W.1. (Reference D.O.T. 12338/E.D./C.C./2.)

Tenders Invited for Aluminium Sulphate

H.M. SENIOR TRADE COMMISSIONER in South Africa reports that the Rand Water Board are calling for tenders (Contract No. 249) for the supply and delivery of 150 short tons, or alternatively 300 short tons, aluminium sulphate or aluminoferric, on or before noon on Friday, November 9, 1923. A copy of the tender form, specification and conditions of tender is available for inspection by British firms at the Department of Overseas Trade (Room 52), 35, Old Queen Street, London, S.W.1. (Reference D.O.T. 12342/E.D./C.C./2.)

Disinfectant Fluid for South Africa

H.M. SENIOR TRADE COMMISSIONER in South Africa reports that the South African Railway Administration are calling for tenders for the supply of disinfectant fluid, during the period January 1 to June 30, 1924. (Tender No. 482.) A copy of the tender form, specification and conditions of tender is available for inspection by British firms at the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1. (Reference D.O.T. 12337/E.D./C.C./2.)

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

BRADLEY AND BLISS, 6, London Street, Reading, manufacturing chemists. (C.C., 20/10/23.) £21 2s. 10d. September 4.

DALEY, Samuel Fielding, 5, Gorsey Hey, Westhoughton, soap manufacturer. (C.C., 20/10/23.) £34 12s. 4d. September 12.

ETON LAUNDRY CO., Wonfleet Road, Skegness, launderers. (C.C., 20/10/23.) £14 10s. 10d. September 14.

HALL, Matthew (trading as ESITOL CHEMICAL CO.), 181, Queen Victoria Street, E.C., merchant. (C.C., 20/10/23.) £43 17s. 4d. September 13.

HERMANN AND CO., Britannia Colour Works, Grimsby, colour makers. (C.C., 20/10/23.) £10 12s. 5d. September 13.

HOGAN, T. C., AND SONS, 75, Oswald Street, Blackburn, animal medicine manufacturers. (C.C., 20/10/23.) £10 5s. 5d. September 13.

MORTON (S.) AND CO., LTD., 38, Cheetham Street, Rochdale, soap merchants. (C.C., 20/10/23.) £10 16s. 6d. August 1.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

ASHBY SOAPS, LTD., Derby. (M., 20/10/23.) Registered October 4, £12,500 debenture, to R. Dobson and another, Manchester; general charge.

BRITISH CYANIDES CO., LTD., London, E.C. (M., 20/10/23.) Registered October 6, debenture, to bank; general charge. *Nil. August 1, 1923.

CLEAR STARCH LAUNDRY, LTD., London, N.W. (M., 20/10/23.) Registered October 8, £1,300 debentures and £3,000 2nd debentures (subject to £1,300 debentures); general charge.

LACTINE, LTD., Yiewsley, manufacturing chemists. (M., 20/10/23.) Registered October 4, £5,000 debentures (filed under sec. 93 (3) of the Companies (Consolidation) Act 1908), present issue £2,000; charged on property at Yiewsley, also general charge (subject to £3,000 debentures). *£3,000. January 10, 1922.

SILVER SPRINGS BLEACHING AND DYEING CO., LTD., Timbersbrook. (M., 20/10/23.) Registered October 3, £599 5s. mortgage, to building society; charged on Quarry Bank, Timbersbrook. *£24,672 8s. 5d. September 10, 1923.

WARD (SAMUEL) AND CO., LTD., London, S.E., paint manufacturers. (M., 20/10/23.) Registered October 8, £6,000 debentures; general charge.

Satisfaction

HANSON, BROWN AND CO., LTD., Middlesbrough, oil merchants, etc. (M.S., 20/10/23.) Satisfaction registered October 4, £5,000, registered December 15, 1909.

London Gazette

Companies Winding Up Voluntarily

ATTY'S MINT BALLS, LTD. (C.W.U.V., 20/10/23.) William Price, appointed liquidator. Meeting of creditors at Old King's Head Chambers, 17, Market Place, Wigan, on Wednesday, October 24, at 3 p.m.

CAUSTIC LIME AND MACADAM CO., LTD. (C.W.U.V., 20/10/23.) Tom Edward Gardner, City Chambers, Bradford, chartered accountant, appointed liquidator. Meeting of creditors at the offices of Messrs. Gardner and Beanland, City Chambers, Bradford, on October 24, at 11 a.m.

Partnerships Dissolved

G. BOOR AND CO, and D. W. GREENHOUGH AND SON (Leonard George BOOR and George David GREENHOUGH), chemical and mineral merchants, brokers and agents, 65, Fenchurch Street, London, E.C.3, by mutual consent as from September 30, 1923. Debts received or paid by G. D. Greenhough, who continues the businesses.

SEAFORTH LAUNDRY (Henry Rupert Hood BARRS and Frederick LAW), laundry proprietors, 14, Seaforth Avenue, New Malden, Surrey, by mutual consent as from July 1, 1923. Debts received and paid by F. Law, who will continue the business.

New Companies Registered

CENTRAL EUROPE COAL CO., LTD., 8a, Billiter Square, London, E.C. Manufacturers of and dealers in chemicals and manures, distillers, dye makers, metallurgists, etc. Nominal capital, £10,000 in £100 shares (50 "A" and 50 "B").

DECOLOURISING MATERIALS, LTD., 25, Market Street, Manchester. Manufacturers, refiners, importers and exporters of an dealers ind decolourising and absorbent materials, and plant used for the refining of oil; chemists, druggists, oil and colourmen, etc. Nominal capital, £1,000 in £1 shares.

LINIUM PRODUCTS SYNDICATE, LTD., 20, Fletcher Gate, Nottingham. To acquire and turn to account any invention relating to the production, treatment, application and use of cellulose or products therefrom, and any machinery and apparatus therefor. Nominal capital, £5,000 in £1 shares (5,990 ordinary and 10 founders').

W. CRAIG MITCHELL AND CO., LTD., 288, Shields Road, Glasgow. Chemical manufacturers, distillers of essences, etc. Nominal capital, £4,000 in £1 shares.

OXFORD GROWERS SUPPLY CO., LTD., manufacturers, suppliers and exporters of fertilisers, manures and chemicals of all kinds, etc. Nominal capital £400 in £1 shares. Solicitors: Andrew, Walsh and Bartram, 116, St. Aldates Street, Oxford.

STOCKWELL BOX CO., LTD., Stockwell Road, Hinckley. Manufacturers of and dealers in paper, and articles made from paper or pulp and materials used in the manufacture or treatment of paper or pulp. Nominal capital, £3,000 in £1 shares.

Oxide, Ltd., in Voluntary Liquidation

A MEETING of the creditors of Oxide, Ltd., Vale Lodge, Norman Road, Hove, Sussex (in voluntary liquidation), was held on October 16, in London, when the chair was taken by the liquidator, Mr. R. Carpenter. A statement of affairs was presented by the liquidator, which disclosed liabilities of £2,851 16s. 2d., all due to unsecured creditors. There were also secured creditors, who were the debenture holders, for £500 and interest accrued £7 4s. 8d. The assets were estimated to realise £1,181 9s. 5d. After allowing for preferential claims the net assets amounted to £666 1s., or a deficiency as regarded the unsecured creditors of £2,185 15s. 2d. The share capital issued and paid up consisted of 2,500 6 per cent. preference shares of £1 each and 2,500 ordinary shares of £1 each, so that the total deficiency as regarded the shareholders was £7,185 15s. 2d.

The position was discussed, and it was eventually decided to confirm the appointment of Mr. Carpenter as liquidator, with a committee of inspection.